

# C-b Shale Oil Venture

2372 G Road - P.O. Box 2687  
Grand Junction, Colorado 81501  
(303) 242-8463

Occidental Oil Shale, Inc.  
Operator  
Ashland Colorado Inc.

# 88064813

TN

859

.CG4

C3754

# 1 v. 1

January 15, 1979

Mr. Peter A. Rutledge  
Area Oil Shale Supervisor  
USDI - Conservation Division  
131 N. 6th - Suite 300  
Grand Junction, Colorado 81501

BLM Library  
D-553A, Building 50  
Denver Federal Center  
P. O. Box 25047  
Denver, CO 80225-0047

Dear Mr. Rutledge:

Enclosed is one complete set (3 volumes) of the C-b Development Monitoring Report #1 dated January 15, 1979. This report contains environmental data for the period from April 1978 through September 1978. Subsequent data, due to data lag, will be reported in the next report. Also enclosed are extra copies of the Air Quality Sections for your transmittal to the EPA and the Colorado APCD.

If you have any questions, please call George Fosdick at 242-8463 Ext. 231.

Sincerely,

C-b SHALE OIL VENTURE

*George E. Fosdick for*

R. E. Thomason

GEF/pe

Encl.

cc: R. J. Fernandes  
J. J. Hill  
R. A. Loucks  
W. F. McDermott

C-B SHALE OIL VENTURE

2000-1999-10-10-1000  
2000-1999-10-10-1000  
2000-1999-10-10-1000

2000-1999-10-10-1000  
2000-1999-10-10-1000  
2000-1999-10-10-1000

BLM Library  
D-553A, Building 80  
Denver Federal Center  
P.O. Box 25047  
Denver, CO 80225-0047

Mr. George A. Williams  
1900-1999-10-10-1000  
1900-1999-10-10-1000  
1900-1999-10-10-1000  
1900-1999-10-10-1000

Enclosed is one complete set (1-volume) of the C-B Development  
Report and Survey, dated January 19, 1970. This report contains  
information on the C-B Shale Oil Venture for the period 1960 through 1969.  
This information was, due to data loss, not reported in the  
last report. Also enclosed are copies of the Air Quality  
Report (transmitted to the EPA and the Colorado AGD).

If you have any questions, please call George Foster at  
2000-1999-10-10-1000

Enclosure  
C-B SHALE OIL VENTURE  
*George Foster*  
G. E. Thompson

2000-1999-10-10-1000  
2000-1999-10-10-1000  
2000-1999-10-10-1000  
2000-1999-10-10-1000



U. S. DEPARTMENT OF THE INTERIOR  
PROTOTYPE OIL SHALE LEASING PROGRAM

OIL SHALE TRACT C-b  
DEVELOPMENT MONITORING REPORT #1

(April 1978 through September 1978)

Submitted to:

Mr. Peter A. Rutledge  
Area Oil Shale Supervisor  
Conservation District  
U. S. Geological Survey  
Grand Junction, Colorado

By:

C-b SHALE OIL VENTURE  
ASHLAND COLORADO, INC.  
OCCIDENTAL OIL SHALE, INC., OPERATOR

JANUARY 15, 1978 <sup>9</sup>

UNITED STATES OF AMERICA  
DEPARTMENT OF JUSTICE

IN SENATE  
JANUARY 10, 1967

REPORT OF THE COMMISSION ON THE ORGANIZATION AND ADMINISTRATION OF THE FEDERAL JUDICIAL BRANCH

Presented to the Senate and House of Representatives  
in accordance with the provisions of the  
Judicial Branch Organization Act of 1962  
Public Law 87-1  
H. R. 10000  
S. 10000

U.S. GOVERNMENT PRINTING OFFICE  
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1967

Price: \$1.50



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	F. Scenic Values Study (Inactive)
	G. Industrial Health and Safety
	H. Geology
IV.	DATA AUTOMATION
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IN SENATE

NOV 19 1901

REPORT OF THE COMMISSIONERS OF THE LAND OFFICE

FOR THE YEAR 1901

1901

ALBANY, N. Y.:  
J. B. LIPPINCOTT & CO.,  
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## INTRODUCTION

The Environmental Baseline Period for Oil Shale Tract C-b covered the period from November 1, 1974, to October 31, 1976. Results have been reported in 9 Quarterly Data Reports, 8 Quarterly Summary Reports, Annual Summary and Trends Report and a 5-volume Final Baseline Report, all submitted to the Area Oil Shale Supervisor.

From November 1, 1976, through March 31, 1978, the C-b Tract was under a period of suspension of the Federal Oil Shale Lease. This period, known as the Interim Monitoring Phase, was the subject of interim data reports submitted to the AOSS as follows:

<u>REPORT</u>	<u>SUBMITTAL DATE</u>
Interim Monitoring Report #1 (Nov '76 - Aug '77)	10/14/77
Interim Monitoring Report #1 Supplement (Nov '76 - Aug '77)	12/16/77
Interim Monitoring Report #2 (Sept '77 - Mar '78)	5/15/78

This report covers Development Monitoring, initiated in April 1978, and is titled Development Monitoring Report #1. It contains data from April 1978 through Sept '78 and consists of 3 volumes as indicated in the Table of Contents.

For consistency with all previous data reports, an identical outline and tabbing have been followed in this report.





PRE-EXPLORATION ENVIRONMENTAL RECON

DEVELOPMENT MONITORING PROGRAMS





I. PRE-EXPLORATION ENVIRONMENTAL RECONNAISSANCE SURVEYS

No environmental reconnaissance surveys have been conducted during the development period. The results of previous surveys are contained in Quarterly Data Reports #1 & #2 and are summarized in Summary Reports #1 & #2.

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SURFACE STREAMS

MAJOR GA'  
STATIV

HYDROLOGY &  
WATER QUALITY





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HYDROLOGY & WATER QUALITY

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## II A-1 SURFACE STREAMS

In the first three quarters of 1978 data were collected at all of the fifteen surface water gauging stations shown in Figure II A-1. The period covered began in February 1978 and extended through September 1978. Each station is identified and the data collected at each are identified.

Pages II A-5 through II A-295 summarize all data collected at the above mentioned stations.

<u>Table/Figure No.</u>	<u>Description</u>	<u>Page No.</u>
Figure II A-1	USGS Stream Gauging Station Monitoring Network	II A-3
Table II A-1	Surface Water Data Presented	II A-4

See Section IV for four-digit Station computer code

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U.S.G.S. STREAM GAUGING STATION MONITORING NETWORK

Figure II A-1

TABLE II A-1

SURFACE WATER DATA PRESENTED  
ENVIRONMENTAL MONITORING REPORT

Station	Daily Gauge Height	Daily Mean Sediment & Discharged Data	Dissolved Oxygen	pH Readings	Specific Conductance	Temperature	Turbidity Valves	Sediment Concentrations	Specific Conductance From PS-69 Samples	Temp., pH, D.O. & Conduct- tivity PS-69 Samples	Water Quality Data Process Date 10/3/78
09306007*	X		X	X	X	X					X
09306015	X				X	X					
09306022*	X		X	X	X	X					X
09306025	X				X	X					
09306028	X				X	X					
09306033	X				X	X					
09306036	X				X	X					
09306039	X				X	X					
09306042	X				X	X					
09306050	X				X	X					
09306052	X				X	X					
09306058*	X		X	X	X	X					X
09306061*	X		X	X	X	X					X
09306200*											X
09306222*											X

\* Major gauging station.







USGS WATER GAUGING STATION 09306007  
Piceance Creek Below Rio Blanco

A. DAILY TABLES

1. Gauge Height
2. Dissolved Oxygen
3. pH
4. Specific Conductance
5. Temperature

B. WATER QUALITY DATA

PROCESS DATE 10/3/78







UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION

PICANCE CR BELOW  
RIO BLANCO, COLO  
1979

09306007  
Washington  
District

Used rating table dated 8-3

Gage heights used to half tenths between hundredths below and tenths above these limits.

Gage Read to

Once a Day by

Drainage Area 177

Square Miles

Water-Stage Recorder

for the Year Ending September 30, 1979

OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
1	2.14	3.1	6.5																				
2	2.14	3.2	6.7																				
3	2.06	1.2	2.0	7.4																			
4	2.08	1.7	2.21	2.0																			
5	2.07	1.5	2.22	9.0																			
6	2.15	3.5	2.22	8.8																			
7	2.14	1.3	2.22	2.5																			
8	2.16	3.8	2.26	10.4																			
9	2.16	2.9	2.23	11.3																			
10	2.13	2.1	2.27	10.9																			
11	2.13	5.8	2.28	11.2																			
12	1.96	1.2	2.23	12.5																			
13	2.04	3.2	2.26	10.8																			
14	2.06	2.7	2.23	10.1																			
15	2.02	1.7	2.23	10.1																			
16	2.04	2.1	2.23	10.1																			
17	2.03	1.8	2.22	9.7																			
18	2.05	2.2	2.22	10.1																			
19	2.10	2.8	2.22	9.6																			
20	2.05	2.9	2.21	9.4																			
21	2.7	2.1	2.21	9.5																			
22	2.1	4.2																					
23	2.10	5.7																					
24	2.07	2.1																					
25	2.2	2.9																					
26	2.2	3.4																					
27	2.10	5.6																					
28	2.14	4.4																					
29	2.15	5.0																					
30	2.1	5.4																					
31	2.16	5.5																					
TOTAL																							
Mean.		Second feet per square mile.		Runoff in inches.		Runoff in acre feet.		Maximum.															
5. DISCHARGE DIVIDED BY AREA YIELDED, Y-VALUES ESTIMATED FOR "a"-NO GAGE HEIGHT RECORD, "b" ICE EFFECT																							
Min. Disch.		Sec. ft. on		(G. H.		(L. Min. G. H.		(L. at															

# Coding Form for Input a Update of Daily Values--Continued

Station Identification number **0306007** **PICCAVE CR AL PG PLANO** Water year **1978** **D.O. MAX**

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	10.5						1		9.5	10.8	9.4	8.9	8.7	1
2	10.5						2		9.5	9.1	9.6	8.9	8.7	2
3	11.6						3		9.7	8.8	9.6	8.9	8.7	3
4	11.4						4		11.1	8.6	9.5	8.9	8.7	4
5	9.6						5		9.5	8.6	9.4	8.8	8.7	5
6	11.0						6		9.7	8.7	9.3	8.8	8.7	6
7	9.5						7		11.3	9.0	9.8	8.8	8.7	7
8	11.1						8		9.3	9.2	No Data	8.9	No Data	8
9	11.2						9		11.5	11.0	8.7	8.9	8.7	9
10	11.5						10		9.5	10.0	8.4			10
11	11.2						11		9.1	10.1	8.7	8.9		11
12	14.7						12		9.1	12.0	8.8	8.8	No Data	12
13	16.2						13		11.4	9.8	1.0	8.8	9.7	13
14	12.4						14		11.2	9.4	9.0	8.8	9.0	14
15	11.1						15		9.9	9.9	9.0	8.9	9.0	15
16	11.4						16		11.2	10.0	9.0	8.7	8.8	16
17	14.9						17		10.2	9.4	8.4	8.8	8.8	17
18	11.5						18	9.0	10.2	9.5	9.2	8.8	8.8	18
19	14.1						19	8.8	10.2	9.7	9.0	8.8	8.3	19
20	12.3						20	8.9	9.1	10.1	9.0	8.8	8.4	20
21							21	8.7	10.3	10.2	9.0	8.8	8.4	21
22							22	8.8	11.0	10.1	No Data	8.7	8.4	22
23							23	8.9	11.8	10.1	No Data	8.7	8.7	23
24							24	8.8	12.5	10.0	No Data	8.7	8.4	24
25							25	8.8	12.7	9.9	No Data	8.7	8.5	25
26							26	8.8	12.7	9.8	No Data	8.7	8.5	26
27							27	9.0	12.7	9.8	11. Data	8.8	8.5	27
28							28	9.0	12.4	10.0	9.2	8.7	8.5	28
29							29	9.2	11.8	8.6	9.1	8.7	8.5	29
30							30	9.5	10.9	9.0	9.1	8.7	8.5	30
31							31	-----	10.0	-----	No Data	8.7	-----	31

TOTAL CHECK CARD

Type ☒ T 1 Water Year 1978 20 Total value (sum of daily value entries) 21 32

DO MAY

Preliminary Record  
Subject to Revision

Remarks



Station identification number 09306007 Pigeon Creek Rio Blanco Water year 1979 D.O. MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	8.4						1							1
2	8.4						2							2
3	8.3						3							3
4	8.2						4							4
5	8.3						5							5
6	8.3						6							6
7	8.3						7							7
8	8.2						8							8
9	8.3						9							9
10	8.3						10							10
11	8.3						11							11
12	8.3						12							12
13	8.3						13							13
14	8.3						14							14
15	8.3						15							15
16	8.3						16							16
17	8.3						17							17
18	8.3						18							18
19	8.2						19							19
20	8.2						20							20
21	8.3						21							21
22	8.2						22							22
23	8.3						23							23
24	8.3						24							24
25	8.3						25							25
26	8.3						26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type T Water year 1979

Total value (sum of daily value entries)

21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
----	----	----	----	----	----	----	----	----	----	----	----	---	---	---	---	---	---	---	---	---

Par Code 00500 State Code 00001

Preliminary Record  
Subject to Revision

Remarks

# Coding Form for Input a. pdate of Daily Values--Continued

Station Identification number 09306007

Water year 1978

Piceance Cr. bl. Rio Blanco

D.O. MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	8.5						1		9.2	9.0	8.9	8.7	8.5	1
2	1.4						2		9.3	8.6	9.2	8.7	8.5	2
3	8.2						3		9.5	8.5	9.3	8.6	8.5	3
4	8.4						4		9.4	8.3	9.1	8.6	8.5	4
5	8.6						5		8.1	8.2	8.9	8.5	8.5	5
6	8.3						6		9.0	8.0	9.0	8.5	8.5	6
7	8.0						7		9.0	8.6	9.3	8.6	8.5	7
8	8.2						8		9.1	8.7	8.6	8.7	8.5	8
9	8.2						9		9.1	10.4	8.4	8.9	8.5	9
10	8.2						10		9.4	9.4	8.4	8.9	8.5	10
11	8.7						11		9.5	9.5	8.5	8.7	8.5	11
12	8.7						12		9.7	9.6	8.5	8.7	8.5	12
13	8.3						13		9.5	8.9	8.6	8.7	8.5	13
14	8.0						14		9.6	9.5	8.6	8.7	8.5	14
15	8.6						15		9.7	9.2	8.7	8.6	8.7	15
16	8.6						16		9.7	9.4	8.7	8.6	8.7	16
17	8.2						17		9.5	9.2	8.7	8.6	8.7	17
18	8.5						18	8.6	10.1	9.2	8.7	8.6	8.5	18
19	8.9						19	8.6	9.5	9.2	8.7	8.6	8.5	19
20	8.8						20	8.5	9.5	9.4	8.7	8.6	8.5	20
21							21	8.4	9.8	9.0	8.6	8.6	8.5	21
22							22	8.6	10.1	9.6	8.6	8.6	8.5	22
23							23	8.6	10.8	9.5	8.5	8.5	8.4	23
24							24	8.5	11.4	9.5	8.5	8.4	8.4	24
25							25	8.6	11.9	9.5	8.5	8.4	8.4	25
26							26	8.6	12.3	9.2	8.5	8.4	8.4	26
27							27	8.7	11.0	9.1	8.9	8.6	8.4	27
28							28	8.8	11.4	8.1	8.8	8.5	8.4	28
29							29	8.9	11.0	8.3	8.9	8.5	8.4	29
30							30	9.1	9.8	8.6	8.8	8.5	8.4	30
31							31	9.3	9.3	8.6	8.8	8.5	8.4	31

Total value (sum of daily value entries)

Water year 1978

TOTAL CHECK CARD

Preliminary Record  
Subject to Revision

Code 00200

09306007 Piceance Cr. bl. Rio Blanco

Remarks



Station identification number

00300007 PISCANCO St. M. No 24000

Water year 1979

D.O. M.R.

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	8.2						1							1
2	8.2						2							2
3	8.2						3							3
4	8.2						4							4
5	8.2						5							5
6	8.2						6							6
7	8.2						7							7
8	8.2						8							8
9	8.2						9							9
10	8.2						10							10
11	8.2						11							11
12	8.2						12							12
13	8.2						13							13
14	8.2						14							14
15	8.1						15							15
16	8.2						16							16
17	8.2						17							17
18	8.2						18							18
19	8.2						19							19
20	8.2						20							20
21	8.2						21							21
22	8.2						22							22
23	8.2						23							23
24	8.2						24							24
25	8.2						25							25
26	8.2						26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type T 1

Water year 1979 20

Total value (sum of daily value entries) 21 32

Par Code 00000 Stat Code 00000

Preliminary Record  
Subject to Revision

Remarks

# Coding Form for Input a. Update of Daily Values--Continued

Station identification number 0306007 PLUINGO Water year 1978 D.O. MEAN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	8.4						1		8.1	9.2	9.1	8.8	8.6	1
2	8.2						2		8.4	8.9	9.4	8.8	8.6	2
3	8.4						3		8.6	8.6	9.5	8.8	8.6	3
4	8.8						4		8.5	8.5	9.3	8.6	8.6	4
5	7.6						5		8.0	8.5	9.2	8.7	8.6	5
6	8.3						6		8.8	8.5	9.2	8.8	8.6	6
7	7.8						7		8.2	8.8	9.6	8.7	8.6	7
8	8.4						8		8.2	8.9	9.7	8.8	8.6	8
9	8.2						9		8.0	10.1	8.6	8.8	8.6	9
10	8.1						10		8.2	9.7	8.5	8.8	8.6	10
11	8.1						11		8.1	9.9	8.7	8.8	8.6	11
12	8.0						12		8.5	9.9	8.7	8.7	8.6	12
13	8.5						13		8.1	9.5	8.8	8.8	8.6	13
14	8.5						14		8.1	9.6	8.8	8.8	8.6	14
15	8.2						15		8.3	9.7	8.8	8.7	8.6	15
16	8.0						16		8.1	9.7	8.8	8.6	8.6	16
17	8.6						17		8.1	9.7	8.8	8.7	8.6	17
18	8.0						18	7.0	10.2	9.5	8.8	8.7	8.6	18
19	8.2						19	8.5	8.5	9.5	8.8	8.7	8.6	19
20	9.1						20	8.6	8.2	9.9	8.4	8.7	8.3	20
21							21	8.7	10.0	9.9	8.8	8.7	8.3	21
22							22	8.7	10.4	9.4	8.8	8.7	8.3	22
23							23	8.8	11.1	9.1	8.4	8.6	8.4	23
24							24	8.7	11.8	9.8	8.4	8.6	8.4	24
25							25	8.7	12.3	9.7	8.4	8.7	8.4	25
26							26	8.7	12.5	9.5	No Data	8.6	8.5	26
27							27	8.9	12.4	9.1	7.0	8.6	8.5	27
28							28	8.9	12.0	8.9	9.0	8.6	8.5	28
29							29	9.1	11.4	8.4	9.0	8.6	8.5	29
30							30	8.2	10.5	8.7	9.0	8.6	8.5	30
31							31	8.6	9.6	8.7	No Data	8.6	8.5	31

TOTAL CHECK CARD

Type ☒ T ☐ I Water year  17  18  19  20  21

Per Code 10300 Stat Code 10300

DO MEAN

Preliminary Record  
Subject to Revision

Remarks



Station identifier: 09306007 Piceance Cr. bl. Rio Blanco Water year 1979 D.O. 1979

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	10.5						1							1
2	10.2						2							2
3	9.2						3							3
4	9.5						4							4
5	8.6						5							5
6	8.7						6							6
7	9.0						7							7
8	9.0						8							8
9	9.4						9							9
10	9.9						10							10
11	9.4						11							11
12	9.0						12							12
13	7.6						13							13
14	7.4						14							14
15	8.5						15							15
16	7.8						16							16
17	8.2						17							17
18	9.6						18							18
19	8.7						19							19
20	8.1						20							20
21	9.2						21							21
22	7.7						22							22
23	7.1						23							23
24	7.6						24							24
25	7.6						25							25
26	4.2						26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type T Water year 1979

Total value (sum of daily value entries) 21 32

DATE Code 00003

# Coding Form for Input at update of Daily Values--Continued

Station Identification number

09306007

PRECEDENCE

DATE

Water year

1978

PH MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	8.2	8.2	8.2	8.2	8.3	8.3	1	9.7	9.2	9.3	8.3	8.2	8.2	1
2	8.2	8.1	8.2	8.1	8.3	8.3	2	9.4	9.1	9.3	8.3	9.2	8.2	2
3	8.2	8.0	8.2	8.2	8.3	8.4	3	9.5	9.2	9.3	8.3	8.2	8.2	3
4	8.2	8.0	8.2	8.3	8.3	9.5	4	9.1	9.3	9.2	8.2	8.3	8.2	4
5	8.2	8.1	8.2	8.3	8.3	9.4	5	9.2	9.1	9.4	8.3	8.3	8.2	5
6	8.2	8.1	8.2	8.3	8.3	9.4	6	9.3	9.2	9.3	8.3	8.3	8.2	6
7	8.2	8.1	8.3	8.3	8.3	9.3	7	9.2	9.1	9.2	8.2	8.3	8.2	7
8	8.2	8.1	8.3	8.3	8.3	9.4	8	9.1	9.1	9.2	8.2	8.3	8.2	8
9	8.2	8.1	8.3	8.3	8.3	9.4	9	9.1	9.1	9.2	8.2	8.3	8.2	9
10	8.2	8.0	8.3	8.2	8.3	9.4	10	8.1	9.1	9.2	8.2	8.2	8.2	10
11	8.1	8.1	8.3	8.2	8.3	9.4	11	8.0	9.2	9.2	8.3	8.2	8.2	11
12	8.1	8.1	8.3	8.3	8.3	9.4	12	8.3	9.1	9.1	8.2	8.2	No Data	12
13	8.1	8.2	8.3	8.3	8.3	9.4	13	8.2	9.1	9.3	8.3	8.3	8.4	13
14	8.1	8.2	8.3	8.3	8.3	9.4	14	8.3	9.1	8.4	8.1	8.3	8.4	14
15	8.1	8.2	8.3	8.3	8.3	9.4	15	8.3	8.1	8.4	8.1	8.3	8.3	15
16	8.1	8.2	8.3	8.3	8.3	9.4	16	8.3	8.1	8.3	8.2	8.2	8.3	16
17	8.1	8.2	8.3	8.3	8.3	9.4	17	8.4	8.6	8.3	8.2	8.3	8.2	17
18	8.1	8.2	8.3	8.3	8.3	9.4	18	8.2	9.2	8.3	8.3	8.3	8.3	18
19	8.1	8.1	8.2	8.3	8.3	9.4	19	8.2	8.4	8.3	8.3	8.2	8.3	19
20	8.1	8.2	8.3	8.3	8.3	9.4	20	8.4	8.3	8.3	8.3	8.2	8.3	20
21	8.1	8.2	8.3	8.3	8.3	9.4	21	8.3	9.2	8.1	8.3	8.2	8.3	21
22	8.1	8.2	8.3	8.3	8.3	9.4	22	8.3	9.2	8.2	8.3	8.2	8.3	22
23	8.1	8.2	8.3	8.4	8.3	9.4	23	8.3	9.1	8.2	No Data	8.2	8.2	23
24	8.1	8.2	8.3	8.3	8.3	9.4	24	8.3	9.3	9.2	8.2	8.2	8.2	24
25	8.1	8.2	8.3	8.3	8.3	9.4	25	8.3	9.3	8.3	8.2	8.2	8.2	25
26	8.1	8.2	8.3	8.4	8.2	9.4	26	8.2	9.2	8.3	No Data	8.2	8.2	26
27	8.1	8.2	8.3	8.2	8.2	9.4	27	8.2	9.3	8.3	8.2	8.3	8.2	27
28	8.0	8.2	8.3	8.3	8.3	9.4	28	8.2	9.3	8.3	8.2	8.2	8.2	28
29	8.1	8.1	8.2	8.3	8.3	9.4	29	8.2	9.3	8.3	8.2	8.2	8.1	29
30	8.0	8.1	8.3	8.3	8.3	9.4	30	8.2	9.3	8.3	8.2	8.2	8.1	30
31	8.1	8.3	8.3	8.3	8.3	9.4	31	8.2	9.3	8.3	No Data	8.2	8.1	31

TOTAL CHECK CARD

Type

T

Water year

17 20

Total value (sum of daily value entries)

21 32

Stat Code

00001

pH max

Preliminary Record  
Subject to Revision

Remarks



Station id. location number

00000007 Piacenza Cr. M. Rio Blanco

Water year 1979

PH 1979

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	8.1						1							1
2	8.1						2							2
3	8.2						3							3
4	8.1						4							4
5	8.1						5							5
6	8.1						6							6
7	8.1						7							7
8	8.1						8							8
9	8.2						9							9
10	8.2						10							10
11	8.1						11							11
12	8.1						12							12
13	8.2						13							13
14	8.1						14							14
15	8.0						15							15
16	8.1						16							16
17	8.1						17							17
18	8.1						18							18
19	8.1						19							19
20	8.1						20							20
21	8.0						21							21
22	8.0						22							22
23	8.1						23							23
24	8.0						24							24
25	8.0						25							25
26	8.0						26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Total value (sum of daily value entries)



Type T  
Water year 1979

Preliminary Record  
Subject to Revision

Remarks

PH MIN

Water year 1975

Station identification number 09306007

09306007 Picquante Rd. BL. 2000 Bldg. CO.

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	8.1	8.1	8.0	8.1	8.1	8.2	1	7.9	8.1	7.9	8.2	8.0	8.0	1
2	8.1	7.9	8.2	7.9	8.1	8.2	2	7.6	8.1	8.2	8.2	8.0	8.0	2
3	8.1	7.9	8.2	8.1	8.2	8.2	3	7.5	7.6	8.2	8.2	8.0	8.0	3
4	8.1	7.9	8.2	8.2	8.2	8.2	4	7.5	18.1	8.1	8.1	8.0	8.0	4
5	8.1	7.9	8.2	8.2	8.2	8.2	5	7.8	9.5	8.2	8.1	8.0	8.0	5
6	8.1	7.9	8.2	8.2	8.2	8.2	6	7.5	8.1	8.0	8.2	8.0	8.0	6
7	8.0	7.9	8.2	8.2	8.2	8.2	7	7.6	8.1	8.1	8.1	8.0	8.0	7
8	8.0	8.0	8.2	8.1	8.2	8.2	8	7.9	8.1	8.0	8.1	8.0	8.0	8
9	8.0	8.0	8.2	8.2	8.2	8.2	9	7.9	8.0	8.0	8.1	8.0	8.0	9
10	8.0	7.9	8.2	8.2	8.2	8.2	10	7.9	8.0	8.0	8.1	8.0	8.0	10
11	8.0	7.9	8.2	8.2	8.2	8.2	11	7.9	8.0	8.1	8.2	8.0	8.0	11
12	8.0	8.0	8.2	8.2	8.2	8.2	12	7.8	8.0	8.2	8.1	8.0	8.0	12
13	8.0	8.1	8.2	8.2	8.2	8.2	13	8.2	7.9	8.2	8.1	8.0	8.1	13
14	8.0	8.1	8.2	8.2	8.2	8.2	14	8.2	8.0	8.2	8.0	8.0	8.1	14
15	8.0	8.1	8.2	8.2	8.2	8.2	15	8.2	7.9	8.1	8.0	8.1	8.0	15
16	8.0	8.1	8.2	8.2	8.2	8.2	16	8.2	8.0	8.1	8.0	8.0	8.0	16
17	8.0	8.1	8.2	8.2	8.2	8.2	17	8.3	8.0	8.1	8.1	8.0	8.0	17
18	8.0	8.1	8.2	8.2	8.2	8.2	18	8.2	8.1	8.1	8.1	8.0	8.1	18
19	8.0	8.1	8.2	8.2	8.2	8.2	19	8.2	8.1	8.1	8.2	8.0	8.2	19
20	8.0	8.1	8.2	8.2	8.2	8.2	20	8.2	8.1	8.1	8.1	8.0	8.1	20
21	8.0	8.1	8.2	8.2	8.2	8.2	21	8.2	8.1	8.2	8.2	8.0	8.0	21
22	8.0	8.1	8.2	8.2	8.2	8.2	22	8.2	8.2	8.1	8.1	8.0	8.0	22
23	8.0	8.1	8.2	8.2	8.2	8.2	23	8.2	8.2	8.1	No Data	No Data	7.9	23
24	8.0	8.1	8.2	8.2	8.2	8.2	24	8.1	8.0	8.1	8.1	8.0	8.0	24
25	8.0	8.1	8.2	8.2	8.2	8.2	25	8.1	8.2	8.1	8.1	8.0	8.0	25
26	8.0	8.1	8.2	8.2	8.2	8.2	26	8.1	8.0	8.2	No Data	8.0	8.0	26
27	8.0	8.1	8.2	8.2	8.2	8.2	27	8.2	8.2	8.2	7.9	8.0	8.0	27
28	8.0	8.1	8.2	8.2	8.2	8.2	28	8.1	8.1	8.3	7.9	8.0	8.0	28
29	8.0	8.1	8.2	8.2	8.2	8.2	29	8.2	8.2	8.2	8.0	8.0	8.0	29
30	8.0	8.1	8.2	8.2	8.2	8.2	30	8.1	8.0	8.2	8.0	8.0	8.0	30
31	8.0	8.1	8.2	8.2	8.2	8.2	31	8.1	8.1	8.2	No Data	8.0	8.0	31

TOTAL CHECK CARD

Type ☐ T ☐ 1

Water year 1 17 20

Total value (sum of daily value entries) 21 32

pH min

Preliminary Record  
Subject to Revision

Remarks



0930607 Piceance Cr. bl. Rio Blanco

Station identification number

Water year 1975

三十一

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	7.9						1							1
2	7.9						2							2
3	7.9						3							3
4	7.9						4							4
5	7.9						5							5
6	7.9						6							6
7	7.9						7							7
8	7.9						8							8
9	7.9						9							9
10	7.6						10							10
11	7.9						11							11
12	7.8						12							12
13	7.9						13							13
14	7.9						14							14
15	7.5						15							15
16	7.8						16							16
17	7.9						17							17
18	7.3						18							18
19	7.8						19							19
20	7.3						20							20
21	7.9						21							21
22	7.9						22							22
23	7.8						23							23
24	7.7						24							24
25	7.7						25							25
26	7.9						26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type	Water year
T	1979
1	17
	20

Total value (sum of daily value entries)	21	32
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09700 0100. 666

# Preliminary Record Subject to Revision

Remarks

Station identification number 0996207 precip at St. Joe Ind. Water year 1978 PH mean

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	8.1	8.1	8.1	8.2	8.2	8.2	1	8.1	8.2	8.2	8.2	8.1	8.1	1
2	8.2	8.0	8.2	8.0	8.2	8.3	2	8.1	8.3	8.2	8.3	8.1	8.1	2
3	8.2	8.0	8.2	8.2	8.2	8.3	3	8.6	8.3	8.2	8.3	8.1	8.1	3
4	8.1	8.0	8.2	8.2	8.3	8.4	4	8.7	8.3	8.2	8.1	8.1	8.1	4
5	8.1	8.0	8.2	8.2	8.2	8.2	5	8.9	8.3	8.2	8.2	8.1	8.1	5
6	8.1	8.0	8.2	8.2	8.2	8.3	6	8.6	8.3	8.1	8.2	8.1	8.1	6
7	8.1	8.0	8.2	8.3	8.3	8.3	7	8.9	8.1	8.1	8.2	8.1	8.1	7
8	8.1	8.0	8.2	8.2	8.2	8.3	8	8.0	8.1	8.1	8.2	8.1	No Data	8
9	8.1	8.0	8.2	8.2	8.3	8.4	9	8.9	8.1	8.1	8.2	8.1	8.1	9
10	8.1	8.0	8.2	8.2	8.3	8.3	10	8.0	8.0	8.1	8.2	8.1	8.1	10
11	8.1	8.0	8.2	8.2	8.3	8.3	11	8.9	8.1	8.1	8.2	8.1	8.1	11
12	8.1	8.1	8.2	8.2	8.3	8.3	12	No Data	8.6	8.8	8.2	8.1	No Data	12
13	8.0	8.1	8.2	8.3	8.3	8.3	13	8.3	8.0	8.2	8.2	8.1	8.3	13
14	8.0	8.1	8.2	8.2	8.2	8.3	14	8.3	8.0	8.3	8.1	8.2	8.3	14
15	8.0	8.1	8.2	8.3	8.3	8.3	15	8.2	8.0	8.2	8.1	8.2	8.2	15
16	8.0	8.1	8.2	8.3	8.3	8.3	16	8.3	8.0	8.2	8.1	8.1	8.1	16
17	8.0	8.1	8.2	8.3	8.3	8.3	17	8.3	8.1	8.2	8.1	8.2	8.1	17
18	8.0	8.0	8.2	8.3	8.3	8.3	18	8.3	8.1	8.2	8.2	8.1	8.2	18
19	8.0	8.0	8.2	8.3	8.3	8.3	19	8.2	8.2	8.2	8.2	8.1	8.2	19
20	8.0	8.0	8.2	8.3	8.3	8.3	20	8.3	8.2	8.2	8.2	8.1	8.2	20
21	8.1	8.1	8.2	8.3	8.3	8.3	21	8.3	8.1	8.2	8.2	8.1	8.2	21
22	8.1	8.1	8.2	8.3	8.3	8.3	22	8.3	8.2	8.1	8.2	8.1	8.1	22
23	8.1	8.1	8.2	8.3	8.3	8.3	23	8.2	8.2	8.2	No Data	No Data	8.1	23
24	8.1	8.1	8.2	8.3	8.3	8.3	24	8.2	8.2	8.2	8.1	8.1	8.1	24
25	8.1	8.1	8.2	8.3	8.3	8.3	25	8.2	8.2	8.2	8.1	8.1	8.1	25
26	8.1	8.1	8.2	8.3	8.3	8.3	26	8.2	8.2	8.2	8.1	8.1	8.1	26
27	8.1	8.1	8.2	8.3	8.3	8.3	27	8.2	8.3	8.2	8.0	8.1	8.1	27
28	8.1	8.1	8.2	8.3	8.3	8.3	28	8.2	8.1	8.2	8.1	8.1	8.1	28
29	8.1	8.1	8.2	8.3	8.3	8.3	29	8.1	8.2	8.2	8.1	8.1	8.0	29
30	8.0	8.1	8.2	8.2	8.2	8.2	30	8.2	8.2	8.2	8.1	8.1	8.0	30
31	8.0	8.1	8.2	8.2	8.2	8.2	31	8.2	8.2	8.2	No Data	8.1	8.0	31

TOTAL CHECK CARD

Type ☒ T ☐ 1

Water year  17 20

Total value (sum of daily value entries)  21 32

PH mean

Preliminary Record  
Subject to Revision

Remarks



0950007 Ficance G. A. Rio Negro

Station identification number

Water year 1979

PH mean

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	3.0						1							1
2	4.0						2							2
3	5.1						3							3
4	3.0						4							4
5	4.0						5							5
6	3.0						6							6
7	4.0						7							7
8	3.0						8							8
9	3.0						9							9
10	3.0						10							10
11	5.0						11							11
12	5.0						12							12
13	3.0						13							13
14	3.0						14							14
15	4.9						15							15
16	7.9						16							16
17	4.9						17							17
18	4.9						18							18
19	4.9						19							19
20	4.9						20							20
21	7.9						21							21
22	4.9						22							22
23	4.9						23							23
24	4.9						24							24
25	6.9						25							25
26	7.9						26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type

Water year

Total value (sum of daily value entries)

Par Code 001100

00000000

[illegible]

### Preliminary Record Subject to Revision

Remarks

# Coding Form for Input a Update of Daily Values--Continued

Station identification number **09306007** **COND MAX**

Water year **1978**

Card No. 01

Card No. 02

Card No. 03

Card No. 04

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	1214	1132	1020	993	1154	1072	1	307	254	1256	1370	1506	1215	1
2	1230	1130	1020	993	1194	1100	2	624	99	1218	1358	1588	1208	2
3	1104	1290	1053	998	1114	1066	3	622	32	1166	1340	1344	1236	3
4	1244	1288	1052	998	990	1044	4	962	892	1276	1326	1390	1210	4
5	1230	1243	1066	1010	1052	1120	5	954	0	1152	1320	1356	1262	5
6	1215	1295	992	994	1012	1132	6	715	1054	1268	1298	1316	1278	6
7	1132	1213	1024	992	1012	1108	7	994	1094	1218	1338	1340	1228	7
8	1210	1213	992	994	1012	1188	8	992	1054	1294	1336	1298	1298	8
9	1210	1213	992	1012	1012	1066	9	836	1167	1340	1294	1302	1298	9
10	1112	1235	1024	1010	994	1116	10	858	1164	1286	1330	1246	1298	10
11	1156	1235	1024	1010	1116	1116	11	864	1082	1306	1320	1246	1298	11
12	1202	1239	1006	982	1066	1116	12	978	1156	1284	1356	1246	1298	12
13	1202	1216	992	994	1066	1116	13	957	1054	1314	1410	1218	1298	13
14	1202	1212	1038	992	1120	1120	14	952	123	1298	1442	1188	1298	14
15	1210	1214	1038	992	1158	1158	15	938	1054	1316	1356	1246	1298	15
16	1242	1124	992	990	1190	1190	16	896	1135	1324	1356	1246	1298	16
17	1236	1194	1236	994	1114	1114	17	842	1054	1320	1356	1246	1298	17
18	1230	1146	1236	1	1066	1066	18	928	1061	1318	1308	1192	1094	18
19	1180	1145	992	994	1066	1066	19	928	1195	1302	1264	1208	1012	19
20	1152	992	1066	1066	1066	1066	20	954	1162	1370	1282	1208	1066	20
21	1234	1240	1	1040	1066	1066	21	866	1054	1378	1266	1226	1156	21
22	1244	1143	992	1038	1184	1184	22	960	1134	1378	1266	1226	1156	22
23	1220	1152	992	1038	1068	1068	23	1000	1170	1378	1266	1226	1156	23
24	1220	1032	1032	992	1032	1032	24	1000	1170	1378	1266	1226	1156	24
25	1220	1158	1032	992	1118	1118	25	1032	1156	1378	1266	1226	1156	25
26	1202	1214	992	1012	1114	1114	26	1106	1160	1370	1266	1226	1156	26
27	1220	1192	992	1048	1092	1092	27	980	1090	1320	1266	1226	1156	27
28	1220	1190	992	998	1130	1130	28	940	1112	1274	1374	1266	1156	28
29	1220	1134	992	990	1066	1066	29	982	1150	1274	1374	1266	1156	29
30	1202	1206	1040	1002	1066	1066	30	958	1216	1270	1374	1266	1156	30
31	1222	-----	992	1214	1066	1066	31	-----	1234	-----	1374	1266	1156	31

TOTAL CHECK CARD

Type ☐ T ☐ 1

Water year

Total value (sum of daily value entries)

21	22	23	24	25	26	27	28	29	30	31

Far Code **1215** Stat Code **1215**

Preliminary Record  
Subject to Revision

Remarks

09306007 Piceance Cr. bl. Rio Blanco



Station identification number 09306907 Picoante Cr. El Rio Blanco

Water year 1979

COND MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	1173						1							1
2	1196						2							2
3	1134						3							3
4	1154						4							4
5	1146						5							5
6	1108						6							6
7	1156						7							7
8	1108						8							8
9	1124						9							9
10	1106						10							10
11	1115						11							11
12	1150						12							12
13	1152						13							13
14	1160						14							14
15	1150						15							15
16	1151						16							16
17	1106						17							17
18	1142						18							18
19	1194						19							19
20	1116						20							20
21	1118						21							21
22	1086						22							22
23	1170						23							23
24	1144						24							24
25	1100						25							25
26	994						26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type T Water year 1979

Total value (sum of daily value entries) 21 32

Par Code 000005  
Stat Code 000001

Preliminary Record  
Subject to Revision

Remarks

# Coding Form for Input and Update of Daily Values--Continued

Station identification number 09306007

Water year 1978

COND

MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	912	1016	916	920	1030	1004	1	946	950	950	1054	1053	1052	1
2	116	1072	948	No Data	1052	955	2	952	955	916	1046	1120	1052	2
3	926	1116	1052	922	902	926	3	954	852	941	1038	1146	1052	3
4	926	1122	1052	923	930	926	4	948	732	998	1026	1116	1052	4
5	1016	1122	948	932	948	1052	5	950	952	976	934	1076	1260	5
6	926	1120	932	952	942	955	6	950	904	932	1012	1108	1052	6
7	1022	1171	946	918	920	1004	7	963	952	998	1004	1128	1112	7
8	924	1050	952	925	922	901	8	952	952	952	1024	1114	No Data	8
9	920	1052	944	926	932	901	9	932	952	1040	1032	1156	1	9
10	1054	1120	950	952	918		10	768	952	1060	1072			10
11	883	1125	922	948	952		11	994	952	1052	1092	1090		11
12	900	1103	946	941	No Data		12	922	952	1004	1060	1114	No Data	12
13	926	1032	950	946	No Data		13	856	952	1143	1080	1114		13
14	954	1058	956	950	928		14	934	952	1006	1118	1086	952	14
15	942	1058	952	952	1058		15	828	952	1002	1134	996	1014	15
16	966	1058	954	947	1038		16	992	931	1046	1132	1092	1012	16
17	970	1092	912	956	1042		17	762	952	1042	1150	1056	1012	17
18	956	1058	928	956	No Data		18	942	952	1038	1044	1092	992	18
19	928	928	912	918			19	942	952	1060	1062	952	962	19
20	942		No Data	952			20	984	952	1020	1026	1022	946	20
21	112	970	No Data	952	1042		21	800	952	1108	992	1026	994	21
22	1104	1046	954	952	946		22	788	952	1080	992	1102	932	22
23	1050	954	954	954	942		23	840	920	1032	No Data	1056	578	23
24	1056	952	932	906	902		24	864	916	1122		No Data	974	24
25	1052	952	922	926	952		25	910	892	1084		1042	952	25
26	1052	1114	930	916	1034		26	890	894	1046	No Data	1020	1010	26
27	1098	1104	928	932	972		27	846	912	1042	1202	1024	920	27
28	1114	1058	950	926	938		28	848	850	1098	1100	1010	1034	28
29	1159	1030	950	912			29	866	870	1086	1136	1014	952	29
30	1149	950	920	924	-----		30	864	958	1054	1156	1028	1042	30
31	1058	-----	892	932	-----		31	-----	932	-----	No Data	1066	-----	31

TOTAL CHECK CARD

Type T

Water year 1978

Total value (sum of daily value entries)

21	22	23	24	25	26	27	28	29	30	31

Tar Code 1005

Stat Code 0002

COND MIN

Preliminary Record  
Subject to Revision

Remarks

09306007 Piceance Cr. Bl. Rio Blanco



0955007 Piceance Cr. Bl. Rio Blanco

Station	Identification number
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
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18	18
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77	77
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79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
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96	96
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100	100

Water year

10/10/1

Cond

2

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	1002						1							1
2	1002						2							2
3	956						3							3
4	970						4							4
5	960						5							5
6	966						6							6
7	976						7							7
8	986						8							8
9	940						9							9
10	936						10							10
11	943						11							11
12	942						12							12
13	950						13							13
14	922						14							14
15	1018						15							15
16	962						16							16
17	1003						17							17
18	1029						18							18
19	978						19							19
20	1008						20							20
21	1076						21							21
22	1012						22							22
23	984						23							23
24	1005						24							24
25	1006						25							25
26	918						26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type

Water year

27

Water year	1979	17	20
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21

Total value (sum of daily value entries)	
	32

32

[illegible]

# Preliminary Record Subject to Revision

Remarks

Station identification number

09306007

PARCEL C 21 110 112000

Water year 1978

COND

MEAN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	1049	1082	1023	1001	1017	1031	1	582	512	1017	1200	1255	1144	1
2	1047	1130	1023	1001	1106	1013	2	581	501	1063	1194	1255	1131	2
3	1043	1191	1043	983	1041	936	3	544	544	1034	1186	1257	1142	3
4	1123	1241	1029	974	1008	1042	4	176	1101	1098	1176	1239	1134	4
5	1123	1241	999	974	1008	1042	5	663	949	1046	1147	1239	1154	5
6	1100	1110	911	959	938	1042	6	641	918	1085	1152	1218	1135	6
7	1046	1123	910	959	938	1042	7	644	920	1116	1164	1244	1166	7
8	1046	1123	910	959	938	1042	8	976	918	1154	1189	1216	1130	8
9	1046	1123	910	959	938	1042	9	810	918	1154	1164	1224	1130	9
10	1046	1123	910	959	938	1042	10	810	918	1154	1164	1224	1130	10
11	1046	1123	910	959	938	1042	11	810	918	1154	1164	1224	1130	11
12	1046	1123	910	959	938	1042	12	810	918	1154	1164	1224	1130	12
13	1046	1123	910	959	938	1042	13	810	918	1154	1164	1224	1130	13
14	1046	1123	910	959	938	1042	14	810	918	1154	1164	1224	1130	14
15	1046	1123	910	959	938	1042	15	810	918	1154	1164	1224	1130	15
16	1046	1123	910	959	938	1042	16	810	918	1154	1164	1224	1130	16
17	1046	1123	910	959	938	1042	17	810	918	1154	1164	1224	1130	17
18	1046	1123	910	959	938	1042	18	810	918	1154	1164	1224	1130	18
19	1046	1123	910	959	938	1042	19	810	918	1154	1164	1224	1130	19
20	1046	1123	910	959	938	1042	20	810	918	1154	1164	1224	1130	20
21	1046	1123	910	959	938	1042	21	810	918	1154	1164	1224	1130	21
22	1046	1123	910	959	938	1042	22	810	918	1154	1164	1224	1130	22
23	1046	1123	910	959	938	1042	23	810	918	1154	1164	1224	1130	23
24	1046	1123	910	959	938	1042	24	810	918	1154	1164	1224	1130	24
25	1046	1123	910	959	938	1042	25	810	918	1154	1164	1224	1130	25
26	1046	1123	910	959	938	1042	26	810	918	1154	1164	1224	1130	26
27	1046	1123	910	959	938	1042	27	810	918	1154	1164	1224	1130	27
28	1046	1123	910	959	938	1042	28	810	918	1154	1164	1224	1130	28
29	1046	1123	910	959	938	1042	29	810	918	1154	1164	1224	1130	29
30	1046	1123	910	959	938	1042	30	810	918	1154	1164	1224	1130	30
31	1046	1123	910	959	938	1042	31	810	918	1154	1164	1224	1130	31

TOTAL CHECK CARD

Type

T

Water year

1 17 20

Total value (sum of daily value entries)

21 32

Par Code 11495

Stat Code 00003

COND  
MEANPreliminary Record  
Subject to Revision

Remarks



Coding Form for Input and Use of Daily Values--Continued

09306007 Piceance Cr. bl. Rio Blanco

Station identification number

Water year 1979

COND. MEAN

CARD NO.	DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1	1078						1							1
	2	1078						2							2
	3	1043						3							3
	4	1032						4							4
	5	1034						5							5
	6	1065						6							6
	7	1034						7							7
Card No. 02	8	1039						8							8
	9	1041						9							9
	10	1037						10							10
	11	1037						11							11
	12	1045						12							12
	13	1037						13							13
	14	1042						14							14
Card No. 03	15	1091						15							15
	16	1034						16							16
	17	1034						17							17
	18	1034						18							18
	19	1044						19							19
	20	1044						20							20
	21	1100						21							21
Card No. 04	22	1051						22							22
	23	1072						23							23
	24	1072						24							24
	25	1074						25							25
	26	972						26							26
	27							27							27
	28							28							28
	29							29							29
	30							30							30
	31							31							31

TOTAL CHECK CARD

Type T 1 17 20

Total value (sum of daily value entries) 21 32

New Code 000005

Staff Code 000005

Remarks

Coding Form for Input a. pdate of Daily Values--Continued

Station Identification number 09306007 Pineville La 11. 810 000110 Water year 1978 TEMP max

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	14.6	9.8	2.4	1.8	9.6	6.7	1		1.1	18.9	21.7	18.2	18.3	1
2	15.0	9.6	6.6	no data	9.9	9.0	2		1.1	18.0	21.2	21.8	15.2	2
3	13.9	10.3	7.1	0.3	5.5	3.7	3		12.7	15.9	20.9	21.6	19.4	3
4	16.2	10.5	6.2	4.3	3.7	9.1	4		11.6	18.2	19.9	21.4	18.2	4
5	15.1	11.9	3.7	5.1	6.8	9.1	5		11.6	15.4	20.9	21.6	19.7	5
6	14.3	9.7	3.7	3.8	6.2	10.4	6		10.8	18.5	20.1	20.4	20.5	6
7	14.1	10.0	5.1	2.1	3.9	13.6	7		13.1	19.2	21.9	21.5	18.0	7
8	14.5	6.0	3.2	0.3	6.9	DATA	8		13.1	20.9	20.8	19.7	no data	8
9	13.9	5.9	2.8	6.7	6.1	DATA	9		13.1	19.5	19.3	19.0		9
10	16.2	7.3	5.5	6.4	5.3		10		15.1	18.6	20.7			10
11	12.2	7.9	5.9	5.9	1.1		11		16.0	19.1	20.3	18.7		11
12	13.2	5.8	4.5	4.1	no data		12		13.1	17.6	21.1	19.4	no data	12
13	12.9	8.3	3.4	3.3	no data		13		13.1	18.5	22.1	18.0	15.3	13
14	14.0	9.1	5.8	1.4	3.9		14		15.1	19.1	22.5	14.6	13.5	14
15	14.1	9.7	6.1	5.1	5.9		15		18.2	18.1	19.1	19.3	17.3	15
16	14.2	6.9	2.3	9.2	7.4		16		11.1	17.9	19.2	19.9	16.5	16
17	14.2	6.8	5.5	6.4	0.5		17		13.5	18.5	21.2	19.0	17.0	17
18	12.1	9.5	3.2	5.0	no data		18	11.1	13.8	17.8	21.1	17.8	11.9	18
19	13.4	6.4	0.5	4.1			19	11.8	17.2	18.0	19.9	18.3	9.0	19
20	11.8	0.5	no data	5.3			20	13.7	17.8	19.1	21.1	18.9	9.8	20
21	11.1	2.3	no data	6.1	7.0 data		21	9.0	13.8	19.4	20.7	19.5	13.3	21
22	12.5	6.0	6.5	4.0	6.4		22	11.0	17.9	20.2	21.9	16.8	14.8	22
23	12.3	6.7	1.1	2.3	9.1		23	12.8	18.5	20.3	No Data	20.4	17.6	23
24	11.0	4.0	4.6	1.6	9.1		24	16.5	17.9	19.0		no data	13.6	24
25	12.7	9.4	2.2	2.2	9.9		25	12.6	15.9	17.3		18.8	15.9	25
26	12.5	7.5	3.0	4.5	8.9		26	15.2	17.6	20.3	No Data	20.1	16.0	26
27	12.4	5.3	2.9	1.1	9.0		27	9.1	15.3	20.1	22.6	19.1	15.5	27
28	12.3	5.9	4.8	4.1	4.5		28	11.3	15.3	17.9	22.8	19.1	14.6	28
29	12.6	4.4	5.5	4.1			29	12.4	16.6	16.3	19.3	19.5	14.6	29
30	10.2	5.6	7.5	4.0	-----		30	11.9	18.4	18.2	19.4	17.6	13.9	30
31	6.6	-----	2.1	5.1	-----		31	-----	15.1	-----	19.5	19.5	-----	31

TOTAL CHECK CARD

Type ☒ T Water year 17 20

Total value (sum of daily value entries) 21 32

Stat Code 0001

Temp 10.4  
Preliminary Record  
Subject to Revision

Remarks



Coding Form for Input and U of Daily Values--Continued

Station identification number 09305007 Pigeon Lake, N. D. 58050

Water year 1979

TEMP

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	14.0						1							1
2	13.3						2							2
3	12.3						3							3
4	12.6						4							4
5	12.3						5							5
6	13.6						6							6
7	12.8						7							7
8	11.9						8							8
9	12.9						9							9
10	12.4						10							10
11	12.5						11							11
12	13.1						12							12
13	11.0						13							13
14	11.9						14							14
15	12.5						15							15
16	11.5						16							16
17	12.2						17							17
18	12.3						18							18
19	13.3						19							19
20	9.8						20							20
21	12.0						21							21
22	5.6						22							22
23	11.2						23							23
24	10.5						24							24
25	3.6						25							25
26	4.7						26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD  
 Type ☐ T ☐ 1  
 Water year 1979  
 Total value (sum of daily value entries) 21 32  
 Error Code 00010  
 Check Code 00001

Preliminary Record  
Subject to Revision

Remarks



09306007

## Coding Form for Input and Update of Daily Values--Continued

Station identification number 220001 00000000Water year 1978

TEMP MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	3.1	3.9	0.1	0.0	2.7	3.2	1		11.5	5.3	10.0	12.5	10.1	1
2	3.2	3.5	3.1	No data	2.4	1.8	2		5.3	5.9	9.6	10.2	9.5	2
3	3.2	3.5	4.3	0.0	0.0	0.0	3		2.2	6.8	9.1	10.4	1.5	3
4	3.4	4.4	3.6	0.2	0.0	0.0	4		5.0	5.4	8.5	9.4	10.0	4
5	3.9	4.6	0.3	1.0	2.0	3.1	5		3.0	9.9	8.1	9.0	10.2	5
6	3.4	6.2	0.0	3.1	1.0	3.8	6		3.6	5.1	9.3	9.9	11.0	6
7	7.4	6.2	0.6	0.0	0.0	3.4	7		3.0	9.2	9.0	13.5	12.2	7
8	4.1	1.8	0.0	0.0	0.0	6.0	8		4.0	7.9	4.3	10.3	20.5	8
9	4.1	1.0	0.1	0.4	0.4	N.D.	9		3.0	8.9	9.5	11.3	7	9
10	4.5	1.5	1.2	2.4	0.0		10		3.5	9.8	11.1	10.5	11.3	10
11	3.2	2.1	2.1	1.8	0.0		11		3.1	9.2	11.6	10.5	10.5	11
12	3.2	2.5	1.1	0.9	No data		12		4.0	7.7	11.1	11.6	7.0	12
13	3.9	1.9	0.1	0.0	No data		13		3.9	7.7	9.9	12.2	3.3	13
14	4.1	1.9	2.1	0.1	0.0		14		3.0	8.1	10.6	14.1	3.2	14
15	4.1	1.0	1.9	2.5	0.0		15		6.5	9.0	11.1	9.0	3.2	15
16	4.3	3.0	0.3	2.3	0.0		16		7.0	8.7	11.0	13.9	3.0	16
17	4.3	1.3	0.0	2.0	2.0		17		3.4	8.3	12.4	3.3	10.3	17
18	4.3	4.2	0.2	1.2	No data		18		3.9	8.2	10.6	7.9	4.0	18
19	4.1	0.0	0.1	0.0	1		19		2.6	9.6	11.2	6.9	6.2	19
20	5.4	6.0	No data	1.2			20		6.1	8.3	10.4	8.6	5.0	20
21	5.0	3.0	No data	0.8	No data		21		3.9	9.7	9.0	9.9	3.8	21
22	5.6	3.1	0.1	0.0	0.3		22		6.9	9.5	9.1	12.0	5.0	22
23	4.0	0.1	0.1	0.0	0.0		23		7.8	9.5	No Data	10.2	6.4	23
24	4.0	0.2	0.3	0.0	0.0		24		7.0	10.9	1	No data	7.0	24
25	3.9	3.7	0.0	0.0	0.9		25		6.6	10.7	1	9.9	7.5	25
26	3.9	3.5	0.1	0.2	3.1		26		5.5	8.6	No Data	9.3	7.2	26
27	4.1	3.2	0.1	0.1	2.6		27		7.2	9.9	15.2	5.5	6.8	27
28	4.6	3.1	0.0	0.0	0.2		28		6.3	11.6	10.1	8.3	7.0	28
29	5.5	0.1	2.5	0.0			29		6.0	10.3	11.2	5.6	7.1	29
30	5.6	0.7	1.9	0.0	-----		30		7.8	10.3	11.9	2.6	6.5	30
31	5.4	-----	0.1	0.0	-----		31		7.3	-----	No Data	10.1	-----	31

## TOTAL CHECK CARD

Type TWater year 1978

Total value (sum of daily value entries)

II A-28

Remarks

TEMP MIN  
Preliminary Record  
Subject to RevisionForm Code 00010  
Print Code 00002

Station identification number

0030907 Picante Cr. W. Rio D'Amo

Water year 1979

Temp m.p.

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	5.8						1							1
2	6.9						2							2
3	4.1						3							3
4	4.5						4							4
5	5.1						5							5
6	5.1						6							6
7	5.5						7							7
8	5.4						8							8
9	5.6						9							9
10	5.6						10							10
11	5.5						11							11
12	5.0						12							12
13	4.4						13							13
14	3.8						14							14
15	4.3						15							15
16	4.2						16							16
17	6.0						17							17
18	7.7						18							18
19	5.1						19							19
20	6.1						20							20
21	8.1						21							21
22	5.3						22							22
23	4.1						23							23
24	4.0						24							24
25	5.0						25							25
26	3.8						26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type T

Water year

1979

Total value (sum of daily value entries)

21 32

PAR CODE 00010

DATA CODE 00002

Remarks









UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306007 - PICEANCE CREEK BELOW RIO BLANCO, CO.

PROCESS DATE 10/03/78  
DISTRICT CODE 08

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	TEMPER- ATURE (DEG C)	WEATHER *	SURFACE AREA (SQUARE MILES)	COLOR (PLAT- INUM- COBALT UNITS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	DIS- SOLVED OXYGEN (MG/L)	CHEM- ICAL OXYGEN DEMAND (HIGH LEVEL) (MG/L)	PH (UNITS)	CARBON DIOXIDE (CO2) (MG/L)	ALKA- LINITY AS CACO3 (MG/L)	BICAR- BONATE (HCO3) (MG/L)
OCT 21...	1330	9.5	--	177	15	1220	8.9	--	8.1	8.0	520	630
NOV 16...	1045	3.5	0	177	8	1120	9.9	--	8.2	6.2	500	610
DEC 05...	1310	1.7	1	177	7	1030	10.2	46	8.3	4.6	470	570
JAN 16...	1400	4.0	--	177	9	1050	10.0	--	8.4	3.5	440	540
FEB 22...	1100	1.0	0	177	5	1100	10.8	--	8.1	7.8	500	610
MAR 28...	1330	14.5	1	177	12	1050	6.8	51	7.9	11	430	530
APR 18...	1130	5.5	0	177	10	825	9.6	--	8.3	3.2	330	400
MAY 19...	1030	8.5	0	177	9	950	9.3	--	8.2	4.8	390	480
JUN 13...	1245	17.0	1	177	11	1250	9.4	15	8.2	5.2	430	520

\* 0 = Cloudless  
1 = Partly Cloudy

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306007 - PICEANCE CREEK BELOW RIO BLANCO, CO.

PROCESS DATE 10/03/78  
DISTRICT CODE 08

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	CAR- BONATE (CO3) (MG/L)	TOTAL FILT- RABLE RESIDUE (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	OIL AND GREASE (MG/L)	DIS- SOLVED ORGANIC NITRO- GEN (N) (MG/L)	DIS- SOLVED AMMONIA NITRO- GEN (N) (MG/L)	DIS- SOLVED NITRITE (N) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED KJEL. NITRO- GEN (N) (MG/L)	TOTAL KJEL- DAHL NITRO- GEN (N) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	PHOS- PHATE (PO4) (MG/L)
OCT 21....	0	--	--	--	.36	.08	.01	.05	.44	.55	.06	.09
NOV 16....	0	--	--	--	.16	.06	--	--	.22	--	.12	.18
DEC 06....	0	710	2300	0	.04	.07	--	--	.11	--	.28	.49
JAN 16....	1	--	--	--	1.1	.01	--	--	1.1	--	.40	.21
FEB 22....	0	--	--	--	.54	.01	--	--	.55	--	.32	.18
MAR 28....	0	730	480	0	.92	.01	--	--	.93	--	.45	1.3
APR 13....	0	--	--	--	.66	.05	--	--	.71	--	1.4	2.0
MAY 19....	0	--	--	--	.58	.04	--	--	.62	--	.90	.74
JUN 13....	0	950	3	0	.30	.00	--	--	.30	--	.16	.03

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
04306007 - PICEANCE CREEK BELOW RIO BLANCO, CO.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED ORTHO- PHOS- PHATE (PO4) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (MG/L)	DIS- SOL- VED ORGANIC CARBON (C) (MG/L)	SUS- PENDED ORGANIC CARBON (C) (MG/L)	CYANIDE (CN) (MG/L)	TOTAL SUL- FIDE (S) (MG/L)	DIS- SOL- VED SUL- FIDE (S) (MG/L)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)
OCT 21...	.00	.03	.00	6.6	1.0	--	--	--	440	0	81	57
NOV 16...	.03	.06	.01	4.3	.7	--	--	--	400	0	75	52
DEC 06...	.06	.16	.02	4.5	2.9	.00	--	.0	390	0	71	50
JAN 16...	.00	.07	.00	3.5	.9	--	--	--	380	0	74	48
FEB 22...	.03	.06	.01	4.9	3.5	--	--	--	410	0	78	52
MAR 28...	.12	.43	.04	5.6	--	.00	.0	--	380	0	75	47
APR 18...	.09	.64	.03	10	3.8	--	--	--	330	0	68	38
MAY 19...	.03	.24	.01	6.4	1.7	--	--	--	340	0	67	41
JUN 13...	.00	.01	.00	7.5	.8	.00	.0	--	330	0	41	55



UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306007 - PICEANCE CREEK BELOW RIO BLANCO, CO.

PROCESS DATE 10/03/78  
DISTRICT CODE 08

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	PERCENT SODIUM	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SI02) (MG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED BORON (B) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)
OCT 21....	150	3.1	43	3.4	16	190	1.0	17	2	--	250	--
NOV 16....	140	3.0	43	3.1	16	180	1.2	16	2	--	240	--
DEC 06....	130	2.9	42	2.4	13	160	1.2	16	3	800	240	0
JAN 16....	130	2.9	42	2.8	17	170	1.2	18	3	--	220	--
FEB 22....	140	3.0	43	2.7	15	210	1.3	17	2	--	190	--
MAR 28....	120	2.7	40	3.8	13	150	1.0	15	2	400	200	0
APR 18....	80	1.9	35	2.8	9.9	150	.6	13	3	--	130	--
MAY 19....	98	2.3	39	3.2	10	140	.7	15	3	--	150	--
JUN 13....	160	3.8	51	4.8	15	210	.9	18	2	300	250	0

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306007 - PICEANCE CREEK BELOW RIO BLANCO, CO.

PROCESS DATE 10/03/78  
DISTRICT CODE 08

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED CHROMIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MANGANESE (MN) (UG/L)	DIS- SOLVED MOLYBDENUM (MO) (UG/L)	DIS- SOLVED STRONTIUM (SR) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)	DIS- SOLVED ALUMINUM (AL) (UG/L)	DIS- SOLVED LITHIUM (LI) (UG/L)	DIS- SOLVED SILICUM (SE) (UG/L)	ATMOS- PHERIC OZONE (SEVER- ITY)
OCT 21...	--	--	60	--	170	--	--	--	--	--	--	0
NOV 16...	--	--	110	--	280	--	--	--	--	--	--	0
DEC 06...	0	0	30	0	160	4	1600	10	0	20	1	0
JAN 16...	--	--	370	--	100	--	--	--	--	--	--	--
FEB 22...	--	--	180	--	100	--	--	--	--	--	--	0
MAR 28...	0	2	20	0	90	8	1500	0	0	20	2	0
APR 18...	--	--	20	--	30	--	--	--	--	--	--	0
MAY 19...	--	--	60	--	50	--	--	--	--	--	--	0
JUN 13...	15	3	20	15	110	7	1700	20	0	20	0	0

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306007 - PICEANCE CREEK BELOW RIO BLANCO, CO.

PROCESS DATE 10/03/78  
DISTRICT CODE 08

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED GROSS BETA AS CS-137 (PC/L)	SUS- PENED GROSS BETA AS CS-137 (PC/L)	DIS- SOLVED RA-226 (RADON METHOD) (PC/L)	DIS- SOLVED NATURAL URANIUM (U) (UG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM .7UM-MF (COL./ 100 ML)	STREP- TOCOCCHI (COL- ONIES PER 100 ML)	PHENOLS (UG/L)	METHY- LENE BLUE ACTIVE SUB- STANCE (MG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)
OCT 21...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 16...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 06...	3.1	94	.16	2.2	K88	K9	58	3	--	--	--	--
JAN 16...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 22...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 28...	3.8	20	.11	3.3	--	700	620	0	.00	.0	.0	0
APR 18...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 19...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 13...	6.1	4.4	.09	3.7	68	58	--	1	--	--	--	--



UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306007 - PICEANCE CREEK BELOW RIO BLANCO, CO.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DDD IN BOTTOM MA- TERIAL (UG/KG)	ODE IN BOTTOM MA- TERIAL (UG/KG)	DUT IN BOTTOM MA- TERIAL (UG/KG)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	ETHION IN BOTTOM MA- TERIAL (UG/KG)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)	PCB IN BOTTOM MA- TERIAL (UG/KG)	MALA- THION IN BOTTOM MA- TERIAL (UG/KG)	PARA- THION IN BOTTOM MA- TERIAL (UG/KG)
OCT 21...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 16...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 06...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 16...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 22...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 28...	.7	.7	.2	.1	.0	.0	0	.0	.0	0	.0	.0
APR 16...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 19...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 13...	--	--	--	--	--	--	--	--	--	--	--	--

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09JU6007 - PICEANCE CREEK BELOW RIO BLANCO, CO.

PROCESS DATE 10/03/78  
DISTRICT CODE 08

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DI- AZINON IN BOTTOM MA- TERIAL (UG/KG)	METHYL PARA- THION IN BOT- TOM MA- TERIAL (UG/KG)	2,4-D IN BOTTOM MA- TERIAL (UG/KG)	2,4,5-T IN BOTTOM MA- TERIAL (UG/KG)	SILVEX IN BOTTOM MA- TERIAL (UG/KG)	TRI- THION IN BOTTOM MA- TERIAL (UG/KG)	METHYL TRI- THION IN BOT- TOM MA- TERIAL (UG/KG)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DIS- SOLVED SOLIDS (TONS PER AC-FT)	DIS- SOLVED AMMONIA (NH4) (MG/L)	DIS- SOLVED NITRATE (NO3) (MG/L)	DIS- SOLVED NITRITE (NO2) (MG/L)
OCT 21...	--	--	--	--	--	--	--	827	1.12	.10	.22	.03
NOV 16...	--	--	--	--	--	--	--	785	1.07	.08	--	--
DEC 06...	--	--	--	--	--	--	--	729	.99	.09	--	--
JAN 16...	--	--	--	--	--	--	--	731	.99	.01	--	--
FEB 22...	--	--	--	--	--	--	--	819	1.11	.01	--	--
MAR 28...	.0	.0	0	0	0	.0	.0	691	.94	.01	--	--
APR 18...	--	--	--	--	--	--	--	566	.77	.06	--	--
MAY 19...	--	--	--	--	--	--	--	616	.84	.05	--	--
JUN 13...	--	--	--	--	--	--	--	764	1.04	.00	--	--

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306007 - PICEANCE CREEK BELOW RIO BLANCO, CO.

PROCESS DATE 10/03/78  
DISTRICT CODE 08

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	BROMIDE (MG/L)	DIS- SOLVED MERCURY (MG)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE MSL)	DIS- SOLVED GROSS ALPHA AS U-NAT. (UG/L)	SUS- PENDED GROSS ALPHA AS U-NAT. (UG/L)	DIS- SOLVED GROSS BETA AS SR90 /Y90 (PC/L)	SUS- PENDED GROSS BETA AS SR90 /Y90 (PC/L)
OCT 21...	--	.0	6366.00	--	--	--	--
NOV 16...	--	--	6366.00	--	--	--	--
DEC 06...	.1	.0	6366.00	9.2	140	2.8	83
JAN 16...	--	--	6366.00	--	--	--	--
FEB 22...	--	--	6366.00	--	--	--	--
MAR 23...	.1	.0	6366.00	<6.6	40	3.3	18
APR 18...	--	--	6366.00	--	--	--	--
MAY 19...	--	--	6366.00	--	--	--	--
JUN 13...	.2	.0	6366.00	17	<.4	5.5	<.4



USGS WATER GAUGING STATION 09306022  
Stewart Gulch Above West Fork

A. DAILY TABLES

1. Gauge Height
2. Dissolved Oxygen
3. pH
4. Specific Conductance
5. Temperature

B. WATER QUALITY DATA

PROCESS DATE 10/3/78

1977  
Daily Gage Height, In Feet, and Discharge, In Second-Feet, of Stew. G. AB, W. FK. CT. River  
Near Rio Blanco, Colo. for the Year Ending September 30, 19 78

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION

MR. R. O. BLANCO  
1978  
Washington  
District

09306022

Used rating table dated No. 1

Gage height used to half tenths between and  
handfulths below and tenths above these limits.

Drainage Area 57.4 Square Miles. Water-Stage Recorder CONTINUOUS Ratio 1 : 6

Gage Read to  
Once a Day by  
Twice

Date	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
1	2.66	1.0	2.67	1.1	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1
2	2.66	1.0	2.67	1.1	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1
3	2.66	1.0	2.67	1.1	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1
4	2.67	1.1	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2
5	2.67	1.1	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2
6	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2	2.79	2.3
7	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2	2.79	2.3
8	2.67	1.1	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2
9	2.67	1.1	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2
10	2.67	1.1	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2
11	2.67	1.1	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2
12	2.67	1.1	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2
13	2.67	1.1	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2
14	2.67	1.1	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2
15	2.67	1.1	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2
16	2.67	1.1	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2
17	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2	2.79	2.3
18	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2	2.79	2.3
19	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2	2.79	2.3
20	2.68	1.2	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2	2.79	2.3
21	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2	2.79	2.3	2.80	2.4
22	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2	2.79	2.3	2.80	2.4
23	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2	2.79	2.3	2.80	2.4
24	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2	2.79	2.3	2.80	2.4
25	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2	2.79	2.3	2.80	2.4
26	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2	2.79	2.3	2.80	2.4
27	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2	2.79	2.3	2.80	2.4
28	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2	2.79	2.3	2.80	2.4
29	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2	2.79	2.3	2.80	2.4
30	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2	2.79	2.3	2.80	2.4
31	2.69	1.3	2.70	1.4	2.71	1.5	2.72	1.6	2.73	1.7	2.74	1.8	2.75	1.9	2.76	2.0	2.77	2.1	2.78	2.2	2.79	2.3	2.80	2.4
TOTAL	2.71	1.20	2.71	1.20	2.71	1.20	2.71	1.20	2.71	1.20	2.71	1.20	2.71	1.20	2.71	1.20	2.71	1.20	2.71	1.20	2.71	1.20	2.71	1.20
Mean	2.71	1.20	2.71	1.20	2.71	1.20	2.71	1.20	2.71	1.20	2.71	1.20	2.71	1.20	2.71	1.20	2.71	1.20	2.71	1.20	2.71	1.20	2.71	1.20
Second feet per																								
square mile																								
Runoff in inches																								
Runoff in acre-																								
feet																								
Maximum																								
Minimum																								

Preliminary Record  
Subject to Revision



July 1977  
Daily Gage Height, In Feet, and Discharge, In Second-Feet, of STEADFAST GAGE, CH. OF WEST FORK R. & L. RIVER, COLORADO  
for the Year Ending September 30, 1977

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION

WEST FORK GILMAN  
NO 1111100  
1979  
Used rating table dated 10/1

Drainage Area 59.4 Square Miles. Water-Stage Recorder CONTINUOUS Info 1:6  
Gage Read to Once a Day by  
Gage height used to half tenths between hundredths below and tenths above these limits.

October		November		December		January		February		March		April		May		June		July		August		September		Day	
Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Day	Period
1 2.63	.73	1 2.65	.84	1 2.65	.84	1 2.65	.84	1 2.65	.84	1 2.65	.84	1 2.65	.84	1 2.65	.84	1 2.65	.84	1 2.65	.84	1 2.65	.84	1 2.65	.84	1	1
2 2.63	.74	2 2.65	.82	2 2.65	.80	2 2.65	.80	2 2.65	.80	2 2.65	.80	2 2.65	.80	2 2.65	.80	2 2.65	.80	2 2.65	.80	2 2.65	.80	2 2.65	.80	2	2
3 2.64	.79	3 2.65	.80	3 2.65	.80	3 2.65	.80	3 2.65	.80	3 2.65	.80	3 2.65	.80	3 2.65	.80	3 2.65	.80	3 2.65	.80	3 2.65	.80	3 2.65	.80	3	3
4 2.64	.77	4 2.65	.82	4 2.65	.82	4 2.65	.82	4 2.65	.82	4 2.65	.82	4 2.65	.82	4 2.65	.82	4 2.65	.82	4 2.65	.82	4 2.65	.82	4 2.65	.82	4	4
5 2.64	.79	5 2.65	.85	5 2.65	.85	5 2.65	.85	5 2.65	.85	5 2.65	.85	5 2.65	.85	5 2.65	.85	5 2.65	.85	5 2.65	.85	5 2.65	.85	5 2.65	.85	5	5
6 2.65	.84	6 2.65	.85	6 2.65	.85	6 2.65	.85	6 2.65	.85	6 2.65	.85	6 2.65	.85	6 2.65	.85	6 2.65	.85	6 2.65	.85	6 2.65	.85	6 2.65	.85	6	6
7 2.65	.84	7 2.65	.84	7 2.65	.84	7 2.65	.84	7 2.65	.84	7 2.65	.84	7 2.65	.84	7 2.65	.84	7 2.65	.84	7 2.65	.84	7 2.65	.84	7 2.65	.84	7	7
8 2.65	.84	8 2.65	.84	8 2.65	.84	8 2.65	.84	8 2.65	.84	8 2.65	.84	8 2.65	.84	8 2.65	.84	8 2.65	.84	8 2.65	.84	8 2.65	.84	8 2.65	.84	8	8
9 2.66	.86	9 2.66	.86	9 2.66	.86	9 2.66	.86	9 2.66	.86	9 2.66	.86	9 2.66	.86	9 2.66	.86	9 2.66	.86	9 2.66	.86	9 2.66	.86	9 2.66	.86	9	9
10 2.66	.88	10 2.66	.91	10 2.66	.91	10 2.66	.91	10 2.66	.91	10 2.66	.91	10 2.66	.91	10 2.66	.91	10 2.66	.91	10 2.66	.91	10 2.66	.91	10 2.66	.91	10	10
11 2.66	.83	11 2.67	.99	11 2.67	.99	11 2.67	.99	11 2.67	.99	11 2.67	.99	11 2.67	.99	11 2.67	.99	11 2.67	.99	11 2.67	.99	11 2.67	.99	11 2.67	.99	11	11
12 2.66	.87	12 2.68	.103	12 2.68	.103	12 2.68	.103	12 2.68	.103	12 2.68	.103	12 2.68	.103	12 2.68	.103	12 2.68	.103	12 2.68	.103	12 2.68	.103	12 2.68	.103	12	12
13 2.66	.81	13 2.67	.99	13 2.67	.99	13 2.67	.99	13 2.67	.99	13 2.67	.99	13 2.67	.99	13 2.67	.99	13 2.67	.99	13 2.67	.99	13 2.67	.99	13 2.67	.99	13	13
14 2.66	.81	14 2.68	.101	14 2.68	.101	14 2.68	.101	14 2.68	.101	14 2.68	.101	14 2.68	.101	14 2.68	.101	14 2.68	.101	14 2.68	.101	14 2.68	.101	14 2.68	.101	14	14
15 2.65	.79	15 2.68	.103	15 2.68	.103	15 2.68	.103	15 2.68	.103	15 2.68	.103	15 2.68	.103	15 2.68	.103	15 2.68	.103	15 2.68	.103	15 2.68	.103	15 2.68	.103	15	15
16 2.64	.74	16 2.69	.103	16 2.69	.103	16 2.69	.103	16 2.69	.103	16 2.69	.103	16 2.69	.103	16 2.69	.103	16 2.69	.103	16 2.69	.103	16 2.69	.103	16 2.69	.103	16	16
17 2.64	.74	17 2.69	.108	17 2.69	.108	17 2.69	.108	17 2.69	.108	17 2.69	.108	17 2.69	.108	17 2.69	.108	17 2.69	.108	17 2.69	.108	17 2.69	.108	17 2.69	.108	17	17
18 2.64	.73	18 2.69	.103	18 2.69	.103	18 2.69	.103	18 2.69	.103	18 2.69	.103	18 2.69	.103	18 2.69	.103	18 2.69	.103	18 2.69	.103	18 2.69	.103	18 2.69	.103	18	18
19 2.63	.71	19 2.69	.114	19 2.69	.114	19 2.69	.114	19 2.69	.114	19 2.69	.114	19 2.69	.114	19 2.69	.114	19 2.69	.114	19 2.69	.114	19 2.69	.114	19 2.69	.114	19	19
20 2.64	.75	20 2.70	.119	20 2.70	.119	20 2.70	.119	20 2.70	.119	20 2.70	.119	20 2.70	.119	20 2.70	.119	20 2.70	.119	20 2.70	.119	20 2.70	.119	20 2.70	.119	20	20
21 2.64	.75																							21	21
22 2.64	.76																							22	22
23 2.64	.76																							23	23
24 2.65	.80																							24	24
25 2.65	.80																							25	25
26 2.66	.85																							26	26
27 2.66	.88																							27	27
28 2.65	.87																							28	28
29 2.66	.88																							29	29
30 2.67	.91																							30	30
31 2.66	.87																							31	31
Total		Total		Total		Total		Total		Total		Total		Total		Total		Total		Total		Total		Total	
Mean		Mean		Mean		Mean		Mean		Mean		Mean		Mean		Mean		Mean		Mean		Mean		Mean	
Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile	
Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches	
Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet	
Maximum		Maximum		Maximum		Maximum		Maximum		Maximum		Maximum		Maximum		Maximum		Maximum		Maximum		Maximum		Maximum	
Minimum		Minimum		Minimum		Minimum		Minimum		Minimum		Minimum		Minimum		Minimum		Minimum		Minimum		Minimum		Minimum	

PRELIMINARY RECORD  
SUBJECT TO REVISION

6 - DISCHARGE SUBMITTED V-VARIABLE SHIFT. DISCHARGE ESTIMATED FOR  
6 - NO GATE INCIDENT RECORD "6" - 100 effect



# Coding Form for Input r Update of Daily Values--Continued

Station Identification number

Stuart Gulch A/E USST FORM 09306022 Water year 1978

DO. MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	10.1	10.1	10.1	10.1	10.1	10.1	1	10.1	10.1	10.1	10.1	10.1	10.1	1
2	10.1	10.1	10.1	10.1	10.1	10.1	2	10.1	10.1	10.1	10.1	10.1	10.1	2
3	10.0	10.0	10.0	10.0	10.0	10.0	3	10.0	10.0	10.0	10.0	10.0	10.0	3
4	9.5	9.5	9.5	9.5	9.5	9.5	4	9.5	9.5	9.5	9.5	9.5	9.5	4
5	10.3	10.3	10.3	10.3	10.3	10.3	5	10.3	10.3	10.3	10.3	10.3	10.3	5
6	10.1	10.1	10.1	10.1	10.1	10.1	6	10.1	10.1	10.1	10.1	10.1	10.1	6
7	10.2	10.2	10.2	10.2	10.2	10.2	7	10.2	10.2	10.2	10.2	10.2	10.2	7
8	10.3	10.3	10.3	10.3	10.3	10.3	8	10.3	10.3	10.3	10.3	10.3	10.3	8
9	10.1	10.1	10.1	10.1	10.1	10.1	9	10.1	10.1	10.1	10.1	10.1	10.1	9
10	11.0	11.0	11.0	11.0	11.0	11.0	10	11.0	11.0	11.0	11.0	11.0	11.0	10
11	10.3	10.3	10.3	10.3	10.3	10.3	11	10.3	10.3	10.3	10.3	10.3	10.3	11
12	10.5	10.5	10.5	10.5	10.5	10.5	12	10.5	10.5	10.5	10.5	10.5	10.5	12
13	11.0	11.0	11.0	11.0	11.0	11.0	13	11.0	11.0	11.0	11.0	11.0	11.0	13
14	11.5	11.5	11.5	11.5	11.5	11.5	14	11.5	11.5	11.5	11.5	11.5	11.5	14
15	11.3	11.3	11.3	11.3	11.3	11.3	15	11.3	11.3	11.3	11.3	11.3	11.3	15
16	11.3	11.3	11.3	11.3	11.3	11.3	16	11.3	11.3	11.3	11.3	11.3	11.3	16
17	11.3	11.3	11.3	11.3	11.3	11.3	17	11.3	11.3	11.3	11.3	11.3	11.3	17
18	11.3	11.3	11.3	11.3	11.3	11.3	18	11.3	11.3	11.3	11.3	11.3	11.3	18
19	11.3	11.3	11.3	11.3	11.3	11.3	19	11.3	11.3	11.3	11.3	11.3	11.3	19
20	11.3	11.3	11.3	11.3	11.3	11.3	20	11.3	11.3	11.3	11.3	11.3	11.3	20
21	11.3	11.3	11.3	11.3	11.3	11.3	21	11.3	11.3	11.3	11.3	11.3	11.3	21
22	11.3	11.3	11.3	11.3	11.3	11.3	22	11.3	11.3	11.3	11.3	11.3	11.3	22
23	11.3	11.3	11.3	11.3	11.3	11.3	23	11.3	11.3	11.3	11.3	11.3	11.3	23
24	12.1	12.1	12.1	12.1	12.1	12.1	24	12.1	12.1	12.1	12.1	12.1	12.1	24
25	12.1	12.1	12.1	12.1	12.1	12.1	25	12.1	12.1	12.1	12.1	12.1	12.1	25
26	12.1	12.1	12.1	12.1	12.1	12.1	26	12.1	12.1	12.1	12.1	12.1	12.1	26
27	12.1	12.1	12.1	12.1	12.1	12.1	27	12.1	12.1	12.1	12.1	12.1	12.1	27
28	12.1	12.1	12.1	12.1	12.1	12.1	28	12.1	12.1	12.1	12.1	12.1	12.1	28
29	12.1	12.1	12.1	12.1	12.1	12.1	29	12.1	12.1	12.1	12.1	12.1	12.1	29
30	12.1	12.1	12.1	12.1	12.1	12.1	30	12.1	12.1	12.1	12.1	12.1	12.1	30
31	12.1	12.1	12.1	12.1	12.1	12.1	31	12.1	12.1	12.1	12.1	12.1	12.1	31

TOTAL CHECK CARD

Type

T

Water year

1 17 20

Total value (sum of daily value entries)

21 32

Raw Data 300  
Mass Code 00001

Preliminary Record  
Subject to Revision.

Remarks

# Coding Form for Input a. pdate of Daily Values--Continued

Station Identification number

09506025

Station

Water year

1979

DO, M, Y

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	9.0						1							1
2	9.1						2							2
3	9.7						3							3
4	9.4						4							4
5	9.5						5							5
6	9.8						6							6
7	9.5						7							7
8	9.5						8							8
9	9.5						9							9
10	9.9						10							10
11	9.5						11							11
12	9.1						12							12
13	9.2						13							13
14	9.2						14							14
15	9.2						15							15
16	9.6						16							16
17	9.2						17							17
18	9.1						18							18
19	9.1						19							19
20							20							20
21							21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type

T

Water year

1979

Total value (sum of daily value entries)

21 32

00300

00000

Preliminary Record  
Subject to Revision

Remarks



# Coding Form for Input and Update of Daily Values--Continued

Station identification number 09306022

Stuart Gulch FE 1445 FE

Water year 1978

D.O. MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	6.6				NO DATA		1		5.2	4.7	4.1	4.2	5.1	1
2	6.8						2		5.0	4.9		3.6	6.0	2
3	6.2						3		5.5	5.2		3.5	7.5	3
4	6.1						4		5.7	4.9		3.7	7.3	4
5	6.0						5		5.4	4.6		3.8	7.4	5
6	5.1						6		5.6	4.6		2.8	7.0	6
7	5.3						7		5.8	4.7	NO DATA	3.3	6.9	7
8	6.3						8		5.3	4.2	3.6	3.3	4.0	8
9	6.3						9		5.0	4.1	3.1	6.0		9
10	6.3						10		5.3	4.3	3.6	5.8		10
11	6.4						11		5.4	4.5	3.4	5.8	4.0	11
12	6.4						12	5.7	4.6	4.3	3.5	5.7	6.4	12
13	6.3						13	5.8	4.4	4.1	3.5	5.4	6.2	13
14	6.2						14	5.9	4.2	4.0	3.7	5.6	6.1	14
15	6.1						15	5.9	4.2	4.0	4.0	5.8	5.7	15
16	6.1						16	6.6	5.1	4.0	4.0	6.8	5.6	16
17	6.1						17	6.6	5.0	4.0	4.0	5.6	5.3	17
18	6.1						18	5.9	6.1	3.8	3.6	5.6	4.2	18
19	6.1						19	5.9	5.6	3.7	3.1	6.1	6.3	19
20	6.1						20	6.5	5.3	3.6	3.4	5.8	6.8	20
21	6.1						21	6.2	5.5	NO DATA	NO DATA	5.7	6.2	21
22	6.1						22	6.9	5.4	NO DATA	NO DATA	5.6	5.8	22
23	6.1						23	5.5	4.9	NO DATA	NO DATA	5.7	5.7	23
24	6.1						24	5.8	5.0		4.0	5.3	5.6	24
25	6.1						25	5.1	5.6		4.0	5.5	5.4	25
26	6.1						26	5.3	5.0		3.8	5.4	5.4	26
27	6.1						27	5.6	5.5		NO DATA	5.4	5.4	27
28	6.1						28	5.4	5.2		3.6	5.6	5.4	28
29	6.1						29	5.1	4.7		3.5	5.3	5.3	29
30	6.1						30	5.0	4.9	NO DATA	3.5	5.4	5.3	30
31	6.1						31	-----	5.0	-----	-----	5.3	-----	31

TOTAL CHECK CARD

Type T Water year 1978

Total value (sum of daily value entries)

21 22 23 24 25 26 27 28 29 30 31 32

Far Code 00300  
Stat Code 00000

Preliminary Record  
Subject to Revision

Remarks



63

Coding Form for Input and Date of Daily Values--Continued

Station identification number 00306022 Stewart Station Water year 1979 D.O. VAN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	5.0						1							1
2	5.6						2							2
3	5.6						3							3
4	5.3						4							4
5	4.4						5							5
6	5.1						6							6
7	4.5						7							7
8	4.2						8							8
9	3.5						9							9
10	3.8						10							10
11	3.6						11							11
12	3.4						12							12
13	3.7						13							13
14	3.7						14							14
15	3.4						15							15
16	4.2						16							16
17	3.9						17							17
18	4.3						18							18
19	6.7						19							19
20							20							20
21							21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type T Water year 1979

Total value (sum of daily value entries) 00300

21 22 23 24 25 26 27 28 29 30 31

Preliminary Record  
Subject to Revision

Remarks

# Coding Form for Input

Update of Daily Values--Continued

Station identification number 093060022

Start Gubh 28 Wet Form

Water year 1978

D.O. MEAN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	8.0				10.1		1		6.3	6.0	11.1	5.8	6.2	1
2	9.0						2		6.1	6.0	11.1	6.3	3.2	2
3	9.6						3		6.4	6.0		6.7	9.0	3
4	9.6	8.7					4		6.5	5.7		7.4	8.8	4
5	9.1	8.9					5		6.6	5.8		7.9	8.8	5
6	9.2	8.4					6		6.5	5.7		8.0	8.8	6
7	9.2	8.8	9.3				7		6.6	5.7	11.1	7.8	8.4	7
8	9.2	8.8	9.6				8		6.7	5.5	11.1	5.9	7.0	8
9	9.0	8.4	9.1				9		6.0	5.3	11.1	6.9	7.0	9
10	8.3	8.1	9.6				10		6.1	5.1	11.1	6.8	7.0	10
11	8.6		9.6				11		6.2	5.3	11.1	6.8	7.0	11
12	8.6		9.2				12	6.0	5.8	5.6	11.1	6.7	7.6	12
13	8.2		9.8				13	6.4	5.4	5.3	11.1	6.1	8.0	13
14	8.2		9.5				14	6.6	5.2	5.0	11.1	6.2	7.8	14
15	8.2		9.2				15	6.6	5.1	5.1	11.1	7.1	7.2	15
16	8.2		9.1				16	7.4	5.7	5.1	11.1	7.4	7.3	16
17	8.2		9.1				17	7.3	5.9	5.3	11.1	6.7	6.6	17
18	8.2		9.3				18	7.2	6.3	5.2	11.1	6.8	6.4	18
19	8.2		9.6				19	6.9	6.3	4.7	11.1	7.2	7.1	19
20	8.2		9.1				20	9.1	6.5	4.9	11.1	7.2	7.9	20
21	8.2		9.0				21	7.3	6.4	4.9	11.1	6.9	8.1	21
22	8.2		9.2				22	7.1	6.2	4.9	11.1	6.7	7.7	22
23	8.2		9.3				23	6.9	6.0		11.1	6.4	7.5	23
24	8.2		9.0				24	7.0	6.1		11.1	6.5	7.5	24
25	8.2		9.0				25	6.5	6.3		11.1	6.7	7.1	25
26	8.2		9.4				26	6.7	6.2		11.1	6.6	7.2	26
27	8.2		9.4				27	6.8	6.2		11.1	6.5	7.3	27
28	8.2		9.5				28	6.5	6.1		11.1	6.5	7.0	28
29	8.2		9.5				29	6.4	5.9		11.1	6.5	7.0	29
30	8.2		9.5				30	6.4	5.9		11.1	6.7	7.2	30
31	8.2		9.5				31	6.4	6.0		11.1	6.5	7.2	31

TOTAL CHECK CARD

Type T 1

Water year 17 20

Total value (sum of daily value entries) 21 32

DATA CODES 000000  
DATA CODE 000003

Preliminary Record  
Subject to Revision

Remarks



D. O. M. H. N.

Coding Form for Input at plate of Daily Values--Continued

Station identification number

09305022

Station (01-03)

Water year

1979

D. O. M. H. N.

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	7.0						1							1
2	7.1						2							2
3	7.6						3							3
4	7.4						4							4
5	6.9						5							5
6	7.2						6							6
7	6.9						7							7
8	6.9						8							8
9	6.5						9							9
10	6.1						10							10
11	5.3						11							11
12	6.0						12							12
13	5.4						13							13
14	4.2						14							14
15	5.1						15							15
16	6.4						16							16
17	6.0						17							17
18	6.0						18							18
19	7.0						19							19
20							20							20
21							21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Type T 1 17 20

Water year 1979

Bar Code 00300

Preliminary Record  
Subject to Revision

Remarks



# Coding Form for Input a. Update of Daily Values--Continued

Station Identification number 09206032

Water year 1978

Water year 1978

Water year 1978

Water year 1978

Station Identification number 09206032

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	8.3					8.2	1		9.3	8.3	8.3	8.3	8.5	1
2	8.3					8.4	2		9.3	8.3	8.3	8.4	8.5	2
3	9.3					8.2	3		9.3	8.3	8.3	8.4	8.5	3
4	9.3					8.2	4		9.3	8.3	8.3	8.4	8.5	4
5	9.3					8.2	5		9.3	8.3	8.3	8.4	8.5	5
6	9.3					8.2	6		9.3	8.3	8.3	8.4	8.5	6
7	9.3					8.2	7		9.3	8.3	8.3	8.4	8.5	7
8	9.3					8.2	8		9.3	8.3	8.3	8.4	8.5	8
9	9.3					8.2	9		9.3	8.3	8.3	8.4	8.5	9
10	9.3					8.2	10		9.3	8.3	8.3	8.4	8.5	10
11	9.3					8.2	11		9.3	8.3	8.3	8.4	8.5	11
12	9.3					8.2	12		9.3	8.3	8.3	8.4	8.5	12
13	9.3					8.2	13		9.3	8.3	8.3	8.4	8.5	13
14	9.3					8.2	14		9.3	8.3	8.3	8.4	8.5	14
15	9.3					8.2	15		9.3	8.3	8.3	8.4	8.5	15
16	9.3					8.2	16		9.3	8.3	8.3	8.4	8.5	16
17	9.3					8.2	17		9.3	8.3	8.3	8.4	8.5	17
18	9.3					8.2	18		9.3	8.3	8.3	8.4	8.5	18
19	9.3					8.2	19		9.3	8.3	8.3	8.4	8.5	19
20	9.3					8.2	20		9.3	8.3	8.3	8.4	8.5	20
21	9.3					8.2	21		9.3	8.3	8.3	8.4	8.5	21
22	9.3					8.2	22		9.3	8.3	8.3	8.4	8.5	22
23	9.3					8.2	23		9.3	8.3	8.3	8.4	8.5	23
24	9.3					8.2	24		9.3	8.3	8.3	8.4	8.5	24
25	9.3					8.2	25		9.3	8.3	8.3	8.4	8.5	25
26	9.3					8.2	26		9.3	8.3	8.3	8.4	8.5	26
27	9.3					8.2	27		9.3	8.3	8.3	8.4	8.5	27
28	9.3					8.2	28		9.3	8.3	8.3	8.4	8.5	28
29	9.3					8.2	29		9.3	8.3	8.3	8.4	8.5	29
30	9.3					8.2	30		9.3	8.3	8.3	8.4	8.5	30
31	9.3					8.2	31		9.3	8.3	8.3	8.4	8.5	31

TOTAL CHECK CARD

Type T

Water year 1978

Total value (sum of daily value entries)

001/00

Remarks

Preliminary Record  
Subject to Revision

133  
m

Coding Form for Input a. pdate of Daily Values--Continued

1979

Water year

09306022 Stewart Gulch

Station identification number

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	8.6						1							1
2	8.6						2							2
3	8.6						3							3
4	8.6						4							4
5	8.6						5							5
6	8.6						6							6
7	8.6						7							7
8	8.6						8							8
9	8.6						9							9
10	8.6						10							10
11	8.6						11							11
12	8.6						12							12
13	8.6						13							13
14	8.6						14							14
15	8.6						15							15
16	8.6						16							16
17	8.6						17							17
18	8.6						18							18
19	8.6						19							19
20							20							20
21							21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Total value (sum of daily value entries)

21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
----	----	----	----	----	----	----	----	----	----	----	----	---	---	---	---	---	---	---	---	---

Water year

1979

Type

T

Preliminary  
Subject to Revision

marks



# Coding Form for Input and Date of Daily Values--Continued

Station 09306022 notification number 09306022

Stuart Fork AL West 1 mi

Water year 1975

PH MIN

CARD NO.	DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1	8.0				moderate	8.1	1		8.2	8.2	8.2	8.2	8.4	1
	2	8.0					8.1	2		8.2	8.2	8.2	8.2	8.4	2
	3	8.0	moderate				8.1	3		8.2	8.2	8.2	8.2	8.4	3
	4	8.0	8.0				8.1	4		8.2	8.2	8.2	8.3	8.4	4
	5	8.0	8.0	moderate			8.1	5		8.2	8.2	8.2	8.2	8.4	5
	6	8.0	8.0	8.2			8.1	6		8.2	8.2	8.2	8.2	8.4	6
	7	8.0	8.0	8.2			8.1	7		8.2	8.2	8.2	8.2	8.4	7
Card No. 02	8	8.0	8.1	8.2			8.1	8		8.2	8.1	8.2	8.2	8.4	8
	9	8.0	8.1	8.2			8.1	9		8.2	8.2	8.2	8.3	8.4	9
	10	8.0	8.2	8.2			8.1	10		8.2	8.2	8.2	8.3	8.4	10
	11	8.2	8.1	8.1			8.1	11		8.2	8.2	8.2	8.3	8.4	11
	12	8.0		8.1			8.1	12	8.1	8.1	8.2	8.2	8.4	8.5	12
	13	8.0		8.1			8.1	13	8.2	8.1	8.2	8.2	8.3	8.4	13
	14	8.0		8.1			8.1	14	8.2	8.1	8.2	8.2	8.3	8.4	14
Card No. 03	15	8.0		8.1	✓		8.1	15	8.2	8.2	8.1	8.2	8.3	8.4	15
	16	moderate		8.2	moderate		8.1	16	8.2	8.2	8.2	8.3	8.4	8.4	16
	17			8.2	8.2		8.1	17	8.2	8.2	8.2	8.2	8.4	8.4	17
	18			8.2	8.1		8.1	18	8.1	8.3	8.2	8.2	8.4	8.3	18
	19	✓		8.2	8.1		8.1	19	8.1	8.2	8.2	8.2	8.4	8.3	19
	20	moderate		moderate	8.1	✓	8.1	20	8.2	8.2	8.2	8.2	8.4	8.4	20
	21	8.0			8.1	moderate	8.1	21	8.2	8.2	8.2	8.2	8.4	8.3	21
Card No. 04	22	8.0			8.2	8.1	8.1	22	8.2	8.2	8.2	8.3	8.4	8.3	22
	23	8.0			8.2	8.0	8.1	23	8.1	8.2	8.2	8.3	8.4	8.3	23
	24	8.0			8.2	8.0	8.1	24	8.2	8.2	8.2	8.3	8.4	8.4	24
	25	8.0			8.2	8.0	8.1	25	8.1	8.2	8.2	8.2	8.4	8.4	25
	26	8.0			8.2	8.0	8.1	26	8.2	8.2	8.2	8.2	8.4	8.4	26
	27	8.0			8.2	8.0	8.1	27	8.2	8.2	8.2	8.2	8.4	8.4	27
	28	8.0			8.2	8.1	8.1	28	8.2	8.2	8.2	8.2	8.4	8.4	28
Card No. 05	29	8.0	✓		8.2		8.1	29	8.2	8.2	8.2	8.2	8.4	8.4	29
	30	8.0	moderate		8.2	-----		30	8.2	8.2	8.2	8.2	8.4	8.4	30
	31		-----	✓	8.2	-----		31	-----	8.2	-----	8.2	8.4	-----	31

TOTAL CHECK CARD

Type T Water year 1975

Total value (sum of daily value entries)

21	22	23	24	25	26	27	28	29	30	31	32

Per Code 00400  
 Water Code 0022

Preliminary Record  
 Subject to Revision

Remarks



5112  
m112

Coding Form for Input and Update of Daily Values--Continued

PH M11

1979

Water year

03305022 Stewart Gulch

Station identification number

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	8.4						1							1
2	8.5						2							2
3	8.6						3							3
4	8.4						4							4
5	8.4						5							5
6	8.4						6							6
7	8.4						7							7
8	8.4						8							8
9	8.4						9							9
10	8.4						10							10
11	8.4						11							11
12	8.4						12							12
13	8.4						13							13
14	8.4						14							14
15	8.4						15							15
16	8.4						16							16
17	8.4						17							17
18	8.4						18							18
19	8.5						19							19
20							20							20
21							21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type ☐ T ☐ W Water year 1979

Total value (sum of daily value entries) 21 32

Year Code 00400 State Code 00002

Preliminary Record  
Subject to Revision

remarks

# Coding Form for Input a Update of Daily Values--Continued

Station Identification number 09306022

Stuart Gulch 18 WEST FORK

Water year 1978

PH MEAN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	8.1				moderate	8.1	1		8.2	8.2	8.2	8.3	8.4	1
2	8.1				✓	8.1	2		8.2	8.2	8.2	8.3	8.4	2
3	8.1	moderate				8.1	3		8.2	8.2	8.2	8.3	8.4	3
4	8.1	8.1				8.1	4		8.2	8.2	8.2	8.3	8.4	4
5	8.0	8.1	no data			8.1	5		8.2	8.2	8.2	8.3	8.4	5
6	8.0	8.1	8.2			8.1	6		8.2	8.2	8.3	8.4	8.4	6
7	8.0	8.1	8.2			8.1	7		8.2	8.2	8.3	8.3	8.4	7
8	8.1	8.2	8.2			8.1	8		8.2	8.2	8.3	8.3	moderate	8
9	8.1	8.2	8.2			8.1	9		8.2	8.2	8.3	8.4		9
10	8.1	8.2	8.2			8.1	10		8.2	8.2	8.3	8.4		10
11	8.1	8.2	8.2			8.1	11		8.2	8.2	8.3	8.4	moderate	11
12	8.1	8.2	8.2			8.1	12	8.1	8.2	8.2	8.3	8.4	8.5	12
13	8.1	8.2	8.2			8.2	13	8.2	8.2	8.2	8.3	8.3	8.5	13
14	8.1	8.2	8.2			8.2	14	8.2	8.2	8.2	8.3	8.4	8.5	14
15	8.1	8.2	8.2	✓		8.2	15	8.2	8.2	8.2	8.3	8.4	8.5	15
16	moderate	8.2	8.2	moderate		8.1	16	8.2	8.2	8.2	8.3	8.4	8.5	16
17	8.1	8.2	8.2	8.2		8.1	17	8.2	8.2	8.2	8.3	8.4	8.5	17
18	8.1	8.2	8.2	8.2		8.1	18	8.2	8.2	8.2	8.3	8.4	8.4	18
19	8.1	8.2	8.2	8.2	✓	8.1	19	8.2	8.2	8.2	8.3	8.4	8.4	19
20	moderate	8.2	8.2	8.2		8.1	20	8.2	8.2	8.2	8.3	8.4	8.4	20
21	8.1	8.2	8.2	8.2	moderate	8.1	21	8.2	8.2	8.2	8.3	8.4	8.4	21
22	8.1	8.2	8.2	8.2	8.1	8.1	22	8.2	8.2	8.2	8.3	8.4	8.4	22
23	8.1	8.2	8.2	8.2	8.1	8.1	23	8.2	8.2	8.2	8.3	8.4	8.4	23
24	8.1	8.2	8.2	8.2	8.1	8.1	24	8.2	8.2	8.2	8.3	8.4	8.5	24
25	8.1	8.2	8.2	8.2	8.1	8.1	25	8.2	8.2	8.2	8.3	8.4	8.5	25
26	8.1	8.2	8.2	8.2	8.1	8.1	26	8.2	8.2	8.2	8.3	8.4	8.5	26
27	8.1	8.2	8.2	8.2	8.1	8.1	27	8.2	8.2	8.2	8.3	8.4	8.5	27
28	8.1	8.2	8.2	8.2	8.1	8.1	28	8.2	8.2	8.2	8.3	8.4	8.5	28
29	8.1	8.2	8.2	8.2	8.1	8.1	29	8.2	8.2	8.2	8.3	8.4	8.5	29
30	8.1	8.2	8.2	8.2	8.1	8.1	30	8.2	8.2	8.2	8.3	8.4	8.5	30
31	8.1	8.2	8.2	8.2	8.1	8.1	31	8.2	8.2	8.2	8.3	8.4	8.5	31

Total value (sum of daily value entries)

21	20	32
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TOTAL CHECK CARD

Type ☐ T ☐ 1 Water year 17 20

Per Code 00400  
Water Code 000003

Preliminary Record  
Subject to Revision

Remarks



Coding Form for Input of date of Daily Values--Continued

09306022 Stewart Gulch

Water year 1979

Station identification number

PH 1951 PJ

CARD NO.	DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1	2.5						1							1
	2	2.5						2							2
	3	2.6						3							3
	4	2.5						4							4
	5	2.5						5							5
	6	2.5						6							6
	7	2.5						7							7
	8	2.5						8							8
Card No. 02	9	2.5						9							9
	10	2.5						10							10
	11	2.5						11							11
	12	2.5						12							12
	13	2.5						13							13
	14	2.4						14							14
	15	2.6						15							15
	16	2.5						16							16
Card No. 03	17	2.5						17							17
	18	2.5						18							18
	19	2.5						19							19
	20							20							20
	21							21							21
	22							22							22
	23							23							23
	24							24							24
Card No. 04	25							25							25
	26							26							26
	27							27							27
	28							28							28
	29							29							29
	30							30							30
	31							31							31

TOTAL CHECK CARD

Type T 1  
Water year 1979 20

Total value (sum of daily value entries)  
21 32

Year Code 00400  
State Code 00003

Preliminary Record  
Subject to Revision

Remarks



# Coding Form for Input ar "Update of Daily Values--Continued

Station identification number 09206022

Stuart Gulch AR WEST FORK

Water year 1978

COND

MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	1292	1292	1292	1292	1292	1292	1	1292	1292	1292	1292	1292	1292	1
2	1292	1292	1292	1292	1292	1292	2	1292	1292	1292	1292	1292	1292	2
3	1292	1292	1292	1292	1292	1292	3	1292	1292	1292	1292	1292	1292	3
4	1292	1292	1292	1292	1292	1292	4	1292	1292	1292	1292	1292	1292	4
5	1292	1292	1292	1292	1292	1292	5	1292	1292	1292	1292	1292	1292	5
6	1292	1292	1292	1292	1292	1292	6	1292	1292	1292	1292	1292	1292	6
7	1292	1292	1292	1292	1292	1292	7	1292	1292	1292	1292	1292	1292	7
8	1292	1292	1292	1292	1292	1292	8	1292	1292	1292	1292	1292	1292	8
9	1292	1292	1292	1292	1292	1292	9	1292	1292	1292	1292	1292	1292	9
10	1292	1292	1292	1292	1292	1292	10	1292	1292	1292	1292	1292	1292	10
11	1292	1292	1292	1292	1292	1292	11	1292	1292	1292	1292	1292	1292	11
12	1292	1292	1292	1292	1292	1292	12	1292	1292	1292	1292	1292	1292	12
13	1292	1292	1292	1292	1292	1292	13	1292	1292	1292	1292	1292	1292	13
14	1292	1292	1292	1292	1292	1292	14	1292	1292	1292	1292	1292	1292	14
15	1292	1292	1292	1292	1292	1292	15	1292	1292	1292	1292	1292	1292	15
16	1292	1292	1292	1292	1292	1292	16	1292	1292	1292	1292	1292	1292	16
17	1292	1292	1292	1292	1292	1292	17	1292	1292	1292	1292	1292	1292	17
18	1292	1292	1292	1292	1292	1292	18	1292	1292	1292	1292	1292	1292	18
19	1292	1292	1292	1292	1292	1292	19	1292	1292	1292	1292	1292	1292	19
20	1292	1292	1292	1292	1292	1292	20	1292	1292	1292	1292	1292	1292	20
21	1292	1292	1292	1292	1292	1292	21	1292	1292	1292	1292	1292	1292	21
22	1292	1292	1292	1292	1292	1292	22	1292	1292	1292	1292	1292	1292	22
23	1292	1292	1292	1292	1292	1292	23	1292	1292	1292	1292	1292	1292	23
24	1292	1292	1292	1292	1292	1292	24	1292	1292	1292	1292	1292	1292	24
25	1292	1292	1292	1292	1292	1292	25	1292	1292	1292	1292	1292	1292	25
26	1292	1292	1292	1292	1292	1292	26	1292	1292	1292	1292	1292	1292	26
27	1292	1292	1292	1292	1292	1292	27	1292	1292	1292	1292	1292	1292	27
28	1292	1292	1292	1292	1292	1292	28	1292	1292	1292	1292	1292	1292	28
29	1292	1292	1292	1292	1292	1292	29	1292	1292	1292	1292	1292	1292	29
30	1292	1292	1292	1292	1292	1292	30	1292	1292	1292	1292	1292	1292	30
31	1292	1292	1292	1292	1292	1292	31	1292	1292	1292	1292	1292	1292	31

TOTAL CHECK CARD

Type

T

Water year

1978

Total value (sum of daily value entries)

21

32

Par Code 00095

Stat Code 00001

Preliminary Record  
Subject to Revision

Remarks

# Coding Form for Input and date of Daily Values--Continued

Station identification number

09206022

Station name

Water year 1979

COND No. 1

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	1200						1							1
2	1202						2							2
3	1202						3							3
4	1202						4							4
5	1200						5							5
6	1200						6							6
7	1200						7							7
8	1200						8							8
9	1200						9							9
10	1200						10							10
11	1200						11							11
12	1200						12							12
13	1200						13							13
14	1200						14							14
15	1200						15							15
16	1200						16							16
17	1200						17							17
18	1200						18							18
19	1200						19							19
20							20							20
21							21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type

T 1

Water year

1979 20

Total value (sum of daily value entries)

21 32

Rate Code 000000

Water Code 000001

Preliminary Record  
Subject to Revision

Remarks



# Coding Form for Input a Date of Daily Values--Continued

04206082

Station identification number

Water year 1978

COND MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	1252	1252			1252	1252	1		1310	1342	1252	1365	1374	1
2	1252	1252			1252	1252	2		1310	1342	1364	1376	1376	2
3	1252	1252			1252	1252	3		1310	1342	1364	1376	1376	3
4	1252	1252			1252	1252	4		1310	1342	1362	1376	1376	4
5	1252	1252			1252	1252	5		1310	1342	1362	1376	1376	5
6	1252	1252			1252	1252	6		1310	1342	1360	1376	1376	6
7	1252	1252			1252	1252	7		1310	1342	1355	1376	1376	7
8	1252	1252			1252	1252	8		1310	1342	1356	1376	1376	8
9	1252	1252			1252	1252	9		1310	1342	1356	1376	1376	9
10	1252	1252			1252	1252	10		1310	1342	1356	1376	1376	10
11	1252	1252			1252	1252	11		1310	1342	1356	1376	1376	11
12	1252	1252			1252	1252	12	1258	1310	1342	1356	1376	1376	12
13	1252	1252			1252	1252	13	1258	1310	1342	1356	1376	1376	13
14	1252	1252			1252	1252	14	1310	1342	1348	1356	1376	1376	14
15	1252	1252			1252	1252	15	1310	1342	1348	1356	1376	1376	15
16	1252	1252			1252	1252	16	1310	1342	1348	1356	1376	1376	16
17	1252	1252			1252	1252	17	1310	1342	1348	1356	1376	1376	17
18	1252	1252			1252	1252	18	1310	1342	1348	1356	1376	1376	18
19	1252	1252			1252	1252	19	1310	1342	1348	1356	1376	1376	19
20	1252	1252			1252	1252	20	1310	1342	1348	1356	1376	1376	20
21	1252	1252			1252	1252	21	1310	1342	1348	1356	1376	1376	21
22	1252	1252			1252	1252	22	1310	1342	1348	1356	1376	1376	22
23	1252	1252			1252	1252	23	1310	1342	1348	1356	1376	1376	23
24	1252	1252			1252	1252	24	1310	1342	1348	1356	1376	1376	24
25	1252	1252			1252	1252	25	1310	1342	1348	1356	1376	1376	25
26	1252	1252			1252	1252	26	1310	1342	1348	1356	1376	1376	26
27	1252	1252			1252	1252	27	1310	1342	1348	1356	1376	1376	27
28	1252	1252			1252	1252	28	1310	1342	1348	1356	1376	1376	28
29	1252	1252			1252	1252	29	1310	1342	1348	1356	1376	1376	29
30	1252	1252			1252	1252	30	1310	1342	1348	1356	1376	1376	30
31	1252	1252			1252	1252	31	1310	1342	1348	1356	1376	1376	31

TOTAL CHECK CARD

Type ☒ T ☐ 1  
Water year ☐ 17 ☐ 20

Total value (sum of daily value entries)  21  32

Preliminary Record  
Subject to Revision

Remarks



6000  
8

Coding Form for Input at date of Daily Values--Continued

Station identification number 0000000000 Stewart Gulch Water year 1979 Card 1111

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	1370						1							1
2	1350						2							2
3	1350						3							3
4	1350						4							4
5	1374						5							5
6	1374						6							6
7	1374						7							7
8	1374						8							8
9	1374						9							9
10	1374						10							10
11	1374						11							11
12	1372						12							12
13	1372						13							13
14	1374						14							14
15	1372						15							15
16	1370						16							16
17	1368						17							17
18	1374						18							18
19	1374						19							19
20							20							20
21							21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type T Water year 1979 20  
Total value (sum of daily value entries) 21 32

Preliminary Record  
Subject to Revision

emarks

# Coding Form for Input and Update of Daily Values--Continued

Station 09206022  
 Notification number 09206022

Start 6/1/61 AB WEST

Water year 1978

COND MOUNTAIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	1266	1266	1266	1266	1266	1266	1	1321	1321	1347	1367	1380	1381	1
2	1266	1266	1266	1266	1266	1266	2	1321	1321	1347	1368	1383	1380	2
3	1266	1266	1266	1266	1266	1266	3	1321	1321	1347	1368	1383	1380	3
4	1266	1266	1266	1266	1266	1266	4	1319	1319	1347	1366	1382	1381	4
5	1266	1266	1266	1266	1266	1266	5	1321	1321	1344	1366	1380	1380	5
6	1266	1266	1266	1266	1266	1266	6	1315	1315	1343	1363	1380	1381	6
7	1266	1266	1266	1266	1266	1266	7	1319	1319	1349	1363	1375	1381	7
8	1266	1266	1266	1266	1266	1266	8	1320	1320	1350	1362	1383	1381	8
9	1266	1266	1266	1266	1266	1266	9	1314	1314	1351	1361	1381	1381	9
10	1266	1266	1266	1266	1266	1266	10	1319	1319	1352	1360	1381	1381	10
11	1266	1266	1266	1266	1266	1266	11	1319	1319	1352	1359	1380	1381	11
12	1266	1266	1266	1266	1266	1266	12	1347	1347	1352	1366	1381	1381	12
13	1266	1266	1266	1266	1266	1266	13	1312	1312	1353	1361	1381	1381	13
14	1266	1266	1266	1266	1266	1266	14	1319	1319	1353	1360	1380	1380	14
15	1266	1266	1266	1266	1266	1266	15	1320	1320	1354	1359	1382	1381	15
16	1266	1266	1266	1266	1266	1266	16	1324	1324	1354	1358	1380	1381	16
17	1266	1266	1266	1266	1266	1266	17	1323	1323	1354	1358	1383	1381	17
18	1266	1266	1266	1266	1266	1266	18	1323	1323	1354	1358	1383	1381	18
19	1266	1266	1266	1266	1266	1266	19	1325	1325	1354	1358	1383	1381	19
20	1266	1266	1266	1266	1266	1266	20	1325	1325	1354	1358	1383	1381	20
21	1266	1266	1266	1266	1266	1266	21	1322	1322	1354	1358	1383	1381	21
22	1266	1266	1266	1266	1266	1266	22	1322	1322	1354	1358	1383	1381	22
23	1266	1266	1266	1266	1266	1266	23	1321	1321	1354	1358	1383	1381	23
24	1266	1266	1266	1266	1266	1266	24	1319	1319	1354	1358	1383	1381	24
25	1266	1266	1266	1266	1266	1266	25	1316	1316	1354	1358	1383	1381	25
26	1266	1266	1266	1266	1266	1266	26	1315	1315	1354	1358	1383	1381	26
27	1266	1266	1266	1266	1266	1266	27	1315	1315	1354	1358	1383	1381	27
28	1266	1266	1266	1266	1266	1266	28	1314	1314	1354	1358	1383	1381	28
29	1266	1266	1266	1266	1266	1266	29	1313	1313	1354	1358	1383	1381	29
30	1266	1266	1266	1266	1266	1266	30	1310	1310	1354	1358	1383	1381	30
31	1266	1266	1266	1266	1266	1266	31	-----	1347	-----	-----	1380	-----	31

TOTAL CHECK CARD

Type

T

Water Year

17 20

Total value (sum of daily value entries)

21 32

Year Code 020000  
 Sheet Code 000000

Preliminary Record  
 Subject to Revision

marks







# Coding Form for Input and Update of Daily Values--Continued

Station identification number **09306022 Stewart Gulch**

Water year **1979**

**COND**

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	1236						1							1
2	1237						2							2
3	1234						3							3
4	1237						4							4
5	1234						5							5
6	1232						6							6
7	1233						7							7
8	1233						8							8
9	1234						9							9
10	1233						10							10
11	1233						11							11
12	1232						12							12
13	1231						13							13
14	1231						14							14
15	1232						15							15
16	1231						16							16
17	1232						17							17
18	1231						18							18
19	1232						19							19
20							20							20
21							21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type **T** Water year **1979**

Total value (sum of daily value entries) Par Code **00000000** Stat Code **00000000**

Preliminary Record  
Subject to Revision

Remarks

# Coding Form for Input and Output of Daily Values--Continued

Station Identification number 09206022

Stuart Creek AR West Fork

Water year 1978

TEMP max

CARD NO.	DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1	2.5	2.5				2.5	1		17.6	17.6	17.7	15.3	14.1	1
	2	12.4	12.4				11.3	2		14.5	15.5	17.3	17.4	14.5	2
	3	12.9	12.9				8.3	3		14.5	14.7	16.9	17.5	13.4	3
	4	12.4	12.4				11.9	4		10.6	16.0	16.7	17.1	14.1	4
	5	12.7	12.7				11.3	5		13.1	14.8	16.9	17.3	14.0	5
	6	12.7	12.7				11.9	6		12.5	17.0	16.4	16.4	15.3	6
	7	12.8	12.8				14.2	7		12.1	16.2	17.5	17.4	15.2	7
	8	12.8	12.8				14.2	8		17.8	15.4	17.4	14.9	14.1	8
Card No. 02	9	12.4	12.4				14.0	9		15.0	14.3	16.8	14.9	14.1	9
	10	9.4	9.4				12.0	10		13.6	17.5	17.1	13.8	13.8	10
	11	16.6	16.6				12.1	11		17.1	17.2	16.6	13.3	12.1	11
	12	12.5	12.5				9.5	12		20.0	16.4	17.4	14.8	12.2	12
	13	12.1	12.1				11.0	13		9.1	18.2	17.5	12.9	12.9	13
	14	12.4	12.4				10.5	14		18.0	17.1	16.6	10.5	11.7	14
	15	12.7	12.7				12.5	15		14.7	17.9	15.5	14.1	13.9	15
	16	12.7	12.7				13.4	16		14.2	17.6	15.2	9.5	13.6	16
Card No. 03	17	12.7	12.7				14.7	17		15.2	17.2	15.2	14.6	13.9	17
	18	12.7	12.7				14.7	18		15.2	17.1	15.9	14.6	9.8	18
	19	12.7	12.7				12.3	19		18.0	17.0	15.5	13.0	9.4	19
	20	12.7	12.7				14.4	20		17.7	17.5	16.4	13.5	9.9	20
	21	12.7	12.7				16.0	21		13.2	17.0	15.5	14.4	12.1	21
	22	12.7	12.7				10.6	22		16.9	17.8	16.3	14.4	12.2	22
	23	12.7	12.7				16.5	23		17.4	17.1	16.4	13.4	12.5	23
	24	12.7	12.7				12.4	24		17.3	17.1	14.3	14.3	11.8	24
Card No. 04	25	12.7	12.7				11.9	25		15.8	15.1	18.3	14.1	12.1	25
	26	12.7	12.7				11.5	26		17.2	17.1	18.6	14.2	13.5	26
	27	12.7	12.7				16.7	27		15.9	16.3	18.1	14.9	12.3	27
	28	12.7	12.7				11.7	28		16.5	15.2	16.3	14.2	12.4	28
	29	12.7	12.7				11.7	29		17.5	13.2	15.4	14.3	13.1	29
	30	12.7	12.7				10.1	30		16.7	15.0	17.8	14.1	12.9	30
	31	12.7	12.7				10.1	31		16.7	15.0	14.5	13.9	12.9	31

TOTAL CHECK CARD

Type ☒ T

Water year  17  20

Total value (sum of daily value entries)  21  32

Preliminary Record  
Subject to Revision

marks



# Coding Form for Input and Update of Daily Values--Continued

Station Identification number

05306022 Stewart Gulch

Water year

1979

MAX TEMP

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	12.9						1							1
2	12.1						2							2
3	11.7						3							3
4	12.1						4							4
5	12.9						5							5
6	11.1						6							6
7	12.0						7							7
8	12.5						8							8
9	11.5						9							9
10	10.9						10							10
11	10.9						11							11
12	12.1						12							12
13	11.9						13							13
14	9.9						14							14
15	9.0						15							15
16	11.3						16							16
17	10.6						17							17
18	9.5						18							18
19	9.7						19							19
20							20							20
21							21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type

T

Water year

1979

Total value (sum of daily value entries)

21 32

Page 330 00010  
Page 300 00001

Preliminary Record  
Subject to Revision

Remarks

Coding Form for Input and Update of Daily Values--Continued

Station Identification number 09306022 Stuart 64166 NR WEST FL Water year 1978 TEMP MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	5.7					5.6	1		6.5	5.5	7.7	9.0	7.2	1
2	5.9					4.3	2		6.7	5.9	7.2	7.9	7.5	2
3	6.7	4.0 1st				0.5	3		5.9	6.5	7.0	8.1	7.3	3
4	5.8	5.6				3.7	4		6.1	9.0	6.6	7.5	7.6	4
5	2.2	4.3	4.0 1st			5.1	5		5.8	7.1	6.4	6.9	7.5	5
6	9.2	5.9	3.7			5.5	6		5.2	6.6	7.5	7.4	7.3	6
7	6.7	5.5	5.5			4.6	7		5.8	6.9	7.3	5.2	8.2	7
8	4.6	1.4	2.4			3.8	8		5.0	6.8	7.0	7.8	7.0 1st	8
9	5.0	6.6	2.1			4.5	9		6.0	7.0	7.5	8.5	7	9
10	4.7	3.6	3.9			4.9	10		6.3	8.0	8.4	8.7	8.6	10
11	2.9	2.6	3.2			5.5	11			7.4	9.0	9.4	7.0 1st	11
12	3.2	7.1	2.8			5.6	12	7.0	5.5	1.4	8.4	9.1	7.4	12
13	5.4	3.5	2.7			2.6	13	6.3	6.3	7.0	7.2	9.3	5.2	13
14	3.9	3.1	4.7			3.0	14	6.1	6.4	9.1	7.5	8.5	5.4	14
15	4.0	3.8	5.8	7		2.1	15	5.5	1.0	6.9	8.2	6.5	7.2	15
16	7.0 1st	3.5	1.0	4.0 1st		2.0	16	4.8	6.2	6.9	8.4	7.1	8.7	16
17	5.1	3.0 1st	6.3	5.0		3.4	17	4.2	5.7	6.6	8.3	7.9	8.6	17
18	5.1	2.9	2.9	4.0		4.2	18	4.2	5.7	6.6	8.3	7.2	7.1	18
19	5.1	1.3	1.3	3.5		5.2	19	4.7	7.4	7.6	8.4	7.0	6.4	19
20	7.0 1st	4.0	7.0 1st	4.0	7	4.9	20	4.8	6.0	6.7	8.4	5.9	5.9	20
21	5.1	3.0	3.0	3.0	7.0 1st	4.7	21	4.0	8.1	7.1	7.3	7.4	4.2	21
22	5.1	3.0	3.0	3.0	3.5	3.0	22	4.8	6.8	7.4	7.3	8.2	5.1	22
23	2.6	3.0	3.0	3.0	3.7	6.2	23	5.0	7.2	7.7	7.4	7.2	5.0	23
24	5.1	3.0	3.0	3.0	3.7	1.4	24	6.3	6.6	8.8	7.8	8.1	6.2	24
25	5.1	3.0	3.0	3.0	4.1	4.2	25	6.3	6.8	8.2	8.0	7.4	6.5	25
26	5.1	3.0	3.0	3.0	5.5	4.7	26	6.3	5.8	6.8	11.2	7.9	6.2	26
27	5.1	3.0	3.0	3.0	3.7	5.2	27	6.7	6.9	7.6	7.8	7.7	5.4	27
28	4.7	3.0	3.0	3.0	3.5	5.1	28	6.6	6.5	8.9	9.0	6.8	6.2	28
29	4.7	3.0	3.0	3.0	3.5	5.1	29	6.7	6.2	8.3	9.4	6.9	6.3	29
30	4.7	3.0	3.0	3.0	3.5	3.1	30	6.0	6.9	8.1	9.8	6.7	5.1	30
31	5.1	3.0	3.0	3.0	3.5	3.6	31	6.0	7.3	8.1	8.0	6.6	5.1	31

TOTAL CHECK CARD Type T Water year 1978

Total value (sum of daily value entries) 21 32

PRELIMINARY RECORD  
Subject to Revision

Remarks









0930025 STORES Ltd

Station identification number

Water year

1979

Temp 11 91131

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	7.3						1							1
2	8.4						2							2
3	7.2						3							3
4	7.4						4							4
5	7.7						5							5
6	7.1						6							6
7	6.8						7							7
8	7.2						8							8
9	7.5						9							9
10	7.7						10							10
11	6.6						11							11
12	7.9						12							12
13	7.5						13							13
14	6.6						14							14
15	7.4						15							15
16	6.6						16							16
17	6.9						17							17
18	6.6						18							18
19	6.7						19							19
20							20							20
21							21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type

Water year

Total value (sum of daily value entries)

*Chrysomelidae*

**Preliminary Record  
Subject to Revision**

Remarks

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
 09306022 - STEWART GULCH AB WEST FORK, NEAR RIO BLANCO, CO. DISTRICT CODE 08  
 PROCESS DATE 10/03/78

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	TEMPER- ATURE (DEG C)	CODE FOR AGENCY	ANALYZING SAMPLE	WEATHER *	SURFACE AREA (SQUARE MILES)	COLOR (PLAT- INUM- COHALT UNITS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	DIS- SOLVED OXYGEN (MG/L)	CHEM- ICAL OXYGEN DEMAND (HIGH LEVEL) (MG/L)	PH (UNITS)	CARBON DIOXIDE (CO2) (MG/L)	ALKA- LITY AS CACO3 (MG/L)
OCT 21...	1145	9.0	--	--	--	43	5	1300	11.0	--	6.3	4.1	420
NOV 15...	0845	3.5	--	--	0	43	3	1270	10.3	--	8.3	3.8	390
DEC 06...	1100	4.5	--	--	1	43	3	1260	10.8	6	8.2	4.8	390
JAN 17...	1230	8.0	--	--	1	43	4	1250	10.6	--	8.2	5.0	410
FEB 22...	0900	4.0	--	--	0	43	1	1350	9.6	--	8.1	6.5	420
MAR 28...	1000	13.0	--	--	0	43	3	1250	8.6	17	7.9	10	430
APR 18...	1000	10.0	--	--	0	43	2	1200	8.9	--	8.0	7.5	390
MAY 19...	0900	7.0	--	--	0	43	1	1300	8.4	--	8.3	4.1	420
JUN 14...	0830	8.0	--	--	0	43	2	1300	6.7	16	8.4	3.1	400
JUL 26...	1245	16.0	80020	80020	1	43	8	1300	6.4	--	8.1	6.7	430
AUG 16...	1030	9.5	80020	80020	1	43	2	1350	8.1	--	8.3	4.1	420

\* 0 = Cloudless  
 1 = Partly Cloudy



UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
 09306022 - STEWART GULCH AB WEST FORK, NEAR RIO BLANCO, CO. DISTRICT CODE 08  
 PROCESS DATE 10/03/78

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	TOTAL FILT- HABLE RESIDUE (MG/L)	TOTAL NON- FILT- HABLE RESIDUE (MG/L)	OIL AND GREASE (MG/L)	DIS- SOLVED ORGANIC NITRO- GEN (N) (MG/L)	DIS- SOLVED AMMONIA NITRO- GEN (N) (MG/L)	DIS- SOLVED KJEL. NITRO- GEN (N) (MG/L)	DIS- SOLVED NITRATE PLUS NITRATE (N) (MG/L)	PHOS- PHATE (PO4) (MG/L)	DIS- SOLVED PHOS- PHATE (PO4) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)
OCT 21...	510	0	--	--	--	.16	.08	.24	1.0	.00	.09	.00
NOV 16...	470	0	--	--	--	.24	.04	.28	1.2	.06	.00	.02
DEC 06...	480	0	940	34	0	.04	.00	.04	1.4	.06	.03	.02
JAN 17...	500	0	--	--	--	.72	.06	.78	1.3	.06	.06	.02
FEB 22...	510	0	--	--	--	.32	.01	.33	1.2	.21	.00	.07
MAR 28...	520	0	1000	73	0	.19	.00	.19	1.2	.28	.06	.09
APR 18...	470	0	--	--	--	.49	.03	.52	1.1	.03	.06	.01
MAY 19...	510	0	--	--	--	.30	.03	.33	1.1	.09	.03	.03
JUN 14...	490	0	1020	1	0	.59	.00	.59	.90	.03	.00	.01
JUL 26...	530	0	--	--	--	.58	.05	.63	.72	.09	.03	.03
AUG 16...	510	0	--	--	--	.30	.02	.32	1.0	.06	.00	.02

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
 09306022 - STEWART GULCH AB WEST FORK, NEAR RIO BLANCO, CO. DISTRICT CODE 08  
 PROCESS DATE 10/03/78

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (MG/L)	DIS- SOL- VED ORGANIC CARBON (C) (MG/L)	SUS- PENED ORGANIC CARBON (C) (MG/L)	CYANIDE (CN) (MG/L)	TOTAL SUL- FIDE (S) (MG/L)	DIS- SOL- VED SUL- FIDE (S) (MG/L)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO
OCT 21....	.03	2.7	2.0	--	--	--	550	130	90	79	130	2.4
NOV 16....	.00	2.0	.7	--	--	--	550	170	95	77	120	2.2
DEC 06....	.01	2.4	.9	.00	--	.0	560	170	94	79	120	2.2
JAN 17....	.02	2.1	.4	--	--	--	550	140	89	79	130	2.4
FEB 22....	.00	4.1	>5.0	--	--	--	560	140	94	79	110	2.0
MAR 28....	.02	2.7	1.7	.00	.2	--	550	130	91	78	120	2.2
APR 18....	.02	3.7	1.8	--	--	--	550	160	94	76	120	2.2
MAY 19....	.01	2.3	--	--	--	--	540	120	88	78	120	2.2
JUN 14....	.00	4.6	1.0	.00	.2	--	580	170	97	80	130	2.4
JUL 26....	.01	6.9	1.0	--	--	--	570	130	95	80	130	2.4
AUG 16....	.00	2.5	.4	--	--	--	540	120	92	76	130	2.4

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	PERCENT SODIUM	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SI02) (MG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED BORON (B) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)
OCT 21...	34	1.5	6.6	360	.3	15	2	--	80	--	--	--
NOV 16...	32	1.3	6.8	380	.3	16	2	--	100	--	--	--
DEC 06...	32	1.3	7.1	360	.3	16	1	500	90	1	0	1
JAN 17...	34	1.7	7.4	370	.3	15	1	--	80	--	--	--
FEB 22...	30	1.4	7.2	350	.3	15	1	--	90	--	--	--
MAR 28...	32	1.5	6.5	330	.2	15	1	200	80	0	10	0
APR 19...	32	1.6	7.3	350	.2	13	1	--	80	--	--	--
MAY 19...	33	1.5	7.1	350	.3	15	1	--	80	--	--	--
JUN 14...	33	1.8	7.2	370	.3	15	1	200	80	1	0	3
JUL 26...	33	4.8	7.4	360	.3	16	2	--	90	--	--	--
AUG 16...	34	1.5	6.6	360	.3	16	1	--	90	--	--	--



WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MANGANESE (MN) (UG/L)	DIS- SOLVED MOLYB- DENUM (MO) (UG/L)	DIS- SOLVED STRON- TIUM (SR) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	DIS- SOLVED LITHIUM (LI) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	ATMOS- PHERIC ODOR (SEVER- ITY)	DIS- SOLVED GROSS BETA AS CS-137 (PC/L)	SUS- PENDED GROSS BETA AS CS-137 (PC/L)
OCT	10	10	30							0	--	--
DEC	50	--	0	--	--	--	--	--	--	0	--	--
JAN	10	1	20	1	2900	10	0	8	2	0	<2.5	1.6
FEB	30	--	0	--	--	--	--	--	--	0	--	--
MAR	10	--	30	--	--	--	--	--	--	0	--	--
APR	10	3	10	4	2700	10	0	20	1	0	<2.2	3.3
MAY	10	--	20	--	--	--	--	--	--	0	--	--
JUN	10	--	10	--	--	--	--	--	--	0	--	--
JUL	30	9	0	2	2800	30	0	10	1	0	<2.8	<.4
AUG	40	--	10	--	--	--	--	--	--	0	--	--
16...	<10	--	2	--	--	--	--	--	--	0	--	--

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
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 PROCESS DATE 10/03/78

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED RA-226 (RADON METHOD) (PC/L)	DIS- SOLVED NATURAL URANIUM (U) (UG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL. 7JM-MF (COL./ 100 ML)	STREP- TOCOCCHI (COL- ONIES PER 100 ML)	PHENOLS (UG/L)	METHY- LENE BLUE ACTIVE SUB- STANCE (MG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	DDD IN BOTTOM MA- TERIAL (UG/KG)	DDE IN BOTTOM MA- TERIAL (UG/KG)
OCT 21...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 16...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 06...	.09	2.1	--	K68	27	2	--	--	--	--	--	--
JAN 17...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 22...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 28...	.29	2.6	--	--	--	0	.00	.0	.0	0	.0	.0
APR 18...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 19...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 14...	.06	2.6	130	150	--	1	--	--	--	--	--	--
JUL 26...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 16...	--	--	--	--	--	--	--	--	--	--	--	--

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
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 PROCESS DATE 10/03/78

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DNT IN BOTTOM MA- TERIAL (UG/KG)	DI- ELORIN IN BOTTOM MA- TERIAL (UG/KG)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	ETHION IN BOTTOM MA- TERIAL (UG/KG)	TOX- APRENE IN BOTTOM MA- TERIAL (UG/KG)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)	PCH IN BOTTOM MA- TERIAL (UG/KG)	MALA- THION IN BOTTOM MA- TERIAL (UG/KG)	PARA- THION IN BOTTOM MA- TERIAL (UG/KG)	DI- AZINON IN BOTTOM MA- TERIAL (UG/KG)	METHYL PARA- THION IN BOT- TOM MA- TERIAL (UG/KG)
OCT 21...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 16...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 06...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 17...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 22...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 28...	.0	.0	.0	.0	0	.0	.0	0	.0	.0	.0	.0
APR 18...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 19...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 14...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 26...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 16...	--	--	--	--	--	--	--	--	--	--	--	--



WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	2,4-D IN BOTTOM MA- TERIAL (UG/KG)	2,4,5-T IN BOTTOM MA- TERIAL (UG/KG)	SILVEX IN BOTTOM MA- TERIAL (UG/KG)	TRI- THION IN BOTTOM MA- TERIAL (UG/KG)	METHYL TRI- THION IN BOT- TOM MA- TERIAL (UG/KG)	DIS- SOLVED SOLIDS (SUM OF CONSII- TUENTS) (MG/L)	DIS- SOLVED SOLIDS (TONS PER AC-FT)	DIS- SOLVED AMMONIA (NH4) (MG/L)	BROMIDE (BR) (MG/L)
OCT 21...	--	--	--	--	--	939	1.28	.10	--
NOV 16...	--	--	--	--	--	934	1.27	.05	--
DEC 06...	--	--	--	--	--	924	1.26	.00	.1
JAN 17...	--	--	--	--	--	945	1.29	.08	--
FEB 22...	--	--	--	--	--	914	1.24	.01	--
MAR 28...	0	0	0	.0	.0	907	1.23	.00	.1
APR 18...	--	--	--	--	--	899	1.22	.04	--
MAY 19...	--	--	--	--	--	916	1.25	.04	--
JUN 14...	--	--	--	--	--	950	1.29	.00	.1
JUL 26...	--	--	--	--	--	958	1.30	.06	--
AUG 16...	--	--	--	--	--	938	1.28	.03	--

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
 09306022 - STEWART GULCH AB WEST FORK, NEAR RIO BLANCO, CO. DISTRICT CODE 08  
 PROCESS DATE 10/03/78

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED MERCURY (HG) (UG/L)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE MSL)	DIS- SOLVED GROSS ALPHA AS U-NAT. (UG/L)	SUS- PENED GROSS ALPHA AS U-NAT. (UG/L)	DIS- SOLVED GROSS HETA AS SR90 /Y90 (PC/L)	SUS- PENED GROSS BETA AS SR90 /Y90 (PC/L)
OCT 21...	--	6430.00	--	--	--	--
NOV 16...	--	6430.00	--	--	--	--
DEC 06...	.0	6430.00	<9.9	2.0	<2.2	1.6
JAN 17...	--	6430.00	--	--	--	--
FEB 22...	--	6430.00	--	--	--	--
MAR 28...	.0	6430.00	<8.7	4.7	<1.9	3.0
APR 18...	--	6430.00	--	--	--	--
MAY 19...	--	6430.00	--	--	--	--
JUN 14...	.2	6430.00	<11	<.4	<2.5	<.4
JUL 26...	--	6430.00	--	--	--	--
AUG 16...	--	6430.00	--	--	--	--

USGS WATER GAUGING STATION 09306058  
Willow Creek Near Rio Blanco

A. DAILY TABLES

1. Gauge Height
2. Dissolved Oxygen
3. pH
4. Specific Conductance
5. Temperature

B. WATER QUALITY DATA  
PROCESS DATE 10/3/78



Drainage Area 48.7 Square Miles. Water-Stage Recorder CONTINUOUS for the Year Ending September 30, 1978.  
Star R10 BLANKO, CCLP.  
River Willow  
No Creek  
Gage Read to Once a Day by  
Gage used to half tenths between hundredths below and tenths above these limits.  
Used rating table dated 8/1/3  
and feet

October		November		December		January		February		March		April		May		June		July		August		September	
Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
1 2.75	1.2	2.73	1.2	2.87	1.5	2.90	1.5	2.72	1.3	2.72	1.3	2.74	1.3	2.71	1.1	2.59	1.57	2.75	1.0	2.63	1.47	2.70	.61
2 2.75	1.2	2.73	1.2	2.80	1.5	2.82	1.5	2.70	1.2	2.70	1.2	2.72	1.2	2.70	1.0	2.61	1.62	2.75	1.0	2.61	.42	2.52	.18
3 2.73	1.2	2.73	1.2	2.81	1.5	2.82	1.4	2.84	1.9	2.85	1.9	2.82	1.2	2.81	1.5	2.60	1.59	2.72	.90	2.58	.50	2.56	.27
4 2.73	1.2	2.73	1.2	2.80	1.5	2.79	1.4	2.86	2.0	2.87	2.0	2.70	1.1	2.76	1.3	2.60	1.59	2.69	.82	2.57	.30	2.56	.27
5 2.75	1.2	2.74	1.2	2.80	1.5	2.80	1.5	2.87	2.1	2.87	2.1	2.72	1.2	2.79	1.4	2.68	1.84	2.72	.90	2.57	.26	2.58	.31
6 2.76	1.2	2.77	1.3	2.81	1.5	2.80	1.5	2.85	1.9	2.87	2.1	2.72	1.2	2.68	1.97	2.69	1.85	2.66	.72	2.57	.28	2.59	.33
7 2.77	1.2	2.77	1.3	2.83	1.5	2.82	1.5	2.83	1.8	2.88	2.1	2.83	1.7	2.75	1.2	2.70	1.87	2.73	.93	2.55	.16	2.60	.35
8 2.74	1.2	2.76	1.3	2.83	1.5	2.88	1.5	2.81	1.7	2.88	2.1	2.84	1.8	2.76	1.3	2.73	1.79	2.67	.75	2.55	.12	2.62	.39
9 2.73	1.2	2.77	1.3	2.86	1.5	2.85	1.5	2.86	2.0	2.90	2.3	2.85	1.8	2.55	1.57	2.72	1.92	2.65	.70	2.54	.24	2.62	.40
10 2.73	1.2	2.81	1.3	2.81	1.5	2.81	1.5	2.83	1.8	2.90	2.3	2.85	1.8	2.55	1.57	2.72	1.92	2.65	.70	2.54	.24	2.62	.40
11 2.73	1.2	2.77	1.3	2.81	1.5	2.87	1.5	2.81	1.7	2.90	2.3	2.85	1.8	2.55	1.57	2.72	1.92	2.65	.70	2.54	.24	2.62	.40
12 2.76	1.3	2.77	1.3	2.81	1.5	2.87	1.5	2.81	1.7	2.90	2.3	2.85	1.8	2.55	1.57	2.72	1.92	2.65	.70	2.54	.24	2.62	.40
13 2.77	1.3	2.76	1.3	2.84	1.7	2.82	1.7	2.84	1.9	2.90	2.3	2.85	1.8	2.55	1.57	2.72	1.92	2.65	.70	2.54	.24	2.62	.40
14 2.76	1.3	2.76	1.3	2.79	1.4	2.65	1.3	2.81	1.9	2.90	2.3	2.85	1.8	2.55	1.57	2.72	1.92	2.65	.70	2.54	.24	2.62	.40
15 2.75	1.2	2.76	1.4	2.76	1.3	2.76	1.3	2.84	1.9	2.90	2.3	2.85	1.8	2.55	1.57	2.72	1.92	2.65	.70	2.54	.24	2.62	.40
16 2.75	1.2	2.76	1.4	2.68	1.3	2.75	1.3	2.81	1.9	2.90	2.3	2.85	1.8	2.55	1.57	2.72	1.92	2.65	.70	2.54	.24	2.62	.40
17 2.74	1.3	2.76	1.4	2.84	1.7	2.59	1.7	2.90	2.3	2.90	2.3	2.85	1.8	2.55	1.57	2.72	1.92	2.65	.70	2.54	.24	2.62	.40
18 2.76	1.3	2.77	1.4	2.72	1.3	2.53	1.5	2.93	3.4	2.85	2.9	2.77	1.4	2.63	1.62	2.57	1.46	2.62	.50	2.62	.34	2.69	.57
19 2.76	1.3	2.70	1.5	2.91	1.5	2.72	1.5	2.89	2.2	2.87	2.1	2.80	1.6	2.63	1.64	2.57	1.46	2.62	.50	2.62	.34	2.69	.57
20 2.76	1.3	2.73	1.5	2.85	1.5	2.71	1.1	2.84	1.9	2.90	2.3	2.85	1.8	2.55	1.57	2.72	1.92	2.65	.70	2.54	.24	2.62	.40
21 2.74	1.2	2.90	1.5	2.85	1.5	2.65	1.3	2.83	1.9	2.90	2.3	2.85	1.8	2.55	1.57	2.72	1.92	2.65	.70	2.54	.24	2.62	.40
22 2.73	1.2	2.79	1.5	2.85	1.5	2.70	1.1	2.89	2.2	2.87	2.1	2.80	1.6	2.63	1.62	2.57	1.46	2.62	.50	2.62	.34	2.69	.57
23 2.73	1.2	2.74	1.5	2.85	1.5	2.67	1.3	2.89	2.2	2.87	2.1	2.80	1.6	2.63	1.62	2.57	1.46	2.62	.50	2.62	.34	2.69	.57
24 2.73	1.2	2.73	1.5	2.79	1.4	2.71	1.2	2.66	1.1	2.88	2.1	2.80	1.6	2.63	1.62	2.57	1.46	2.62	.50	2.62	.34	2.69	.57
25 2.72	1.2	2.74	1.5	2.82	1.4	2.91	1.2	2.88	1.3	2.85	1.9	2.85	1.8	2.63	1.62	2.57	1.46	2.62	.50	2.62	.34	2.69	.57
26 2.72	1.1	2.78	1.4	2.80	1.4	2.81	1.4	2.80	1.5	2.84	1.9	2.85	1.8	2.63	1.62	2.57	1.46	2.62	.50	2.62	.34	2.69	.57
27 2.72	1.1	2.80	1.4	2.78	1.4	2.82	1.6	2.84	1.9	2.84	1.9	2.85	1.8	2.63	1.62	2.57	1.46	2.62	.50	2.62	.34	2.69	.57
28 2.73	1.3	2.80	1.4	2.79	1.4	2.89	1.6	2.84	1.9	2.84	1.9	2.85	1.8	2.63	1.62	2.57	1.46	2.62	.50	2.62	.34	2.69	.57
29 2.73	1.3	2.82	1.4	2.82	1.4	2.84	1.5	2.84	1.9	2.84	1.9	2.85	1.8	2.63	1.62	2.57	1.46	2.62	.50	2.62	.34	2.69	.57
30 2.73	1.3	2.82	1.4	2.82	1.4	2.84	1.5	2.84	1.9	2.84	1.9	2.85	1.8	2.63	1.62	2.57	1.46	2.62	.50	2.62	.34	2.69	.57
31 2.74	1.3	2.79	1.4	2.83	1.6	2.81	1.4	2.83	1.9	2.83	1.9	2.85	1.8	2.63	1.62	2.57	1.46	2.62	.50	2.62	.34	2.69	.57
TOTAL	38.3	38.9	44.8	44.4	44.4	36.2	44.4	44.4	44.4	46.8	46.8	40.7	40.7	13.07	20.16	20.04	11.8	15.8	0.65	0.38	0.53	0.59	0.65
Mean	1.24	1.33	1.45	1.58	1.58	1.17	1.58	1.58	1.58	1.51	1.51	1.36	1.36	0.42	0.67	0.65	0.38	0.53	0.65	0.38	0.53	0.59	0.65
Standard deviation																							
Roundoff in inches																							
Roundoff in feet																							
Minimum																							
Maximum																							

CAUTION: 1977  
A - ME GAGE HAS NOT BEEN RECALIBRATED. B - 105 EFFICIENCY  
5-DIGIT 105 EFFICIENCY  
MIN. DIAM. 105 EFFICIENCY  
MAX. DIAM. 105 EFFICIENCY

WILLLOW CREEK  
MR. RICHARDSON  
09306058

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION

July 1977  
Daily Gage Height, in Feet, and Discharge, in Second-Feet, of  
WILLLOW CREEK

for the Year Ending September 30, 1977

near R.D. ELAICO, COLO.

Drainage Area 45.7 Square Miles. Water-Stage Recorder CONTINUOUS Ratio 1.6  
Used rating table dated 10/2/53 and feet;  
Gage heights used to half tenths between and  
handwritten below and tenths above these limits.

Date	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
1	2.77	0.95	2.78	0.93																				
2	2.76	0.93	2.77	.94																				
3	2.76	0.93	2.78	.99																				
4		0.93	2.78	1.01																				
5		0.92	.11	1.01																				
6		0.92	2.78	1.07																				
7		0.91	2.78	1.12																				
8		0.91	2.77	1.14																				
9		0.90	2.77	1.16																				
10		0.90	2.77	1.16																				
11		0.89	2.69	.94																				
12		2.75	.92	2.78	1.23																			
13		2.75	.90	2.72	1.12																			
14		2.76	.91	2.70	1.26																			
15		2.76	.92	2.76	1.27																			
16		2.75	.85																					
17		2.75	.81																					
18		2.74	.83																					
19		2.74	.82																					
20		2.74	.83																					
21		2.76	.87																					
22		2.76	.87																					
23		2.77	.87																					
24		2.77	.87																					
25		2.76	.87																					
26		2.76	.85																					
27		2.75	.83																					
28		2.75	.83																					
29		2.75	.82																					
30		2.76	.84																					
31		2.76	.90																					
Total																								

Mean Second-foot per square mile	
Runoff in inches Per inch of area	
Maximum	
Minimum	

Preliminary Record  
Subject to Revision

11 A-79



Station identification number

02306058

Willow Ce

Water year

1978

DO

MAX

CARD	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1	10.0	9.8	10.6	9.8	10.3	1	10.8	11.0	11.5	11.0	11.0	10.0	1
	2	9.7	10.4	11.2	10.9	11.0	2	11.3				8.8	11.0	2
	3	9.6	10.1	11.7	10.5	11.0	3	11.5				8.4	11.0	3
	4	9.5	10.0	12.0	11.1	10.9	4	11.6				8.6	11.0	4
	5	9.5	10.2	10.7	11.0	10.8	5	11.2				8.5	11.0	5
	6	9.3	10.2	10.4	9.9	10.7	6	11.3				8.0	11.0	6
	7	9.1	11.0	10.8	10.4	10.6	7	11.1				7.9	11.0	7
	8	9.7	11.1	10.9	10.9	10.5	8	10.1	11.0	11.5	11.0	7.7	11.0	8
Card No. 02	9	9.4	11.1	10.6	11.4	11.0	9	8.1				7.0	11.0	9
	10	9.6	11.1	10.8	11.0	10.9	10	8.9				6.2	11.0	10
	11	9.5	11.1	10.7	10.9	9.9	11	11.0				5.9	11.0	11
	12	9.0	10.9	10.6	10.5	9.7	12					4.9	11.0	12
	13	9.2	10.5	10.9	10.5	9.8	13					4.5	11.0	13
	14	9.2	10.5	10.9	10.5	9.9	14					4.2	11.0	14
	15	10.3	10.3	9.0	10.9	11.6	15					5.0	11.0	15
	16	10.5	10.7	10.6	10.3	11.2	16					9.9	11.0	16
Card No. 03	17	10.6	8.9	10.6	11.4	11.8	17					11.1	11.0	17
	18	10.5	7.0	10.5	10.8	10.6	18					11.2	11.0	18
	19	10.3	5.7	10.7	10.0	9.9	19					11.3	11.0	19
	20	10.3	9.7	10.7	7.7	11.4	20					10.4	11.0	20
	21	9.2	9.7	9.7	11.2	10.3	21					10.3	11.0	21
	22	10.0	7.5	10.0	11.5	9.1	22					9.2	11.0	22
	23	10.0	9.3	10.1	11.4	9.1	23					9.3	11.0	23
	24	10.0	9.9	10.2	11.3	9.2	24					10.5	11.0	24
Card No. 04	25	9.9	9.6	9.0	8.8	9.9	25					10.2	11.0	25
	26	10.0	9.1	10.2	9.0	9.6	26					10.6	11.0	26
	27	10.0	9.1	9.9	9.2	9.6	27					11.3	11.0	27
	28	9.4	10.5	9.6	8.1	9.4	28					11.2	11.0	28
	29	9.7	10.5	9.0	10.9	11.6	29					10.6	11.0	29
	30	9.6	10.7	8.9	8.0	10.6	30					10.6	11.0	30
	31	9.8	10.1	10.1	7.7	9.3	31					9.5	11.0	31

TOTAL CHECK CARD

Type

T

Water year

1978

Total value (sum of daily value entries)

21

00300

00001

Preliminary Record  
Subject to Revision

Remarks



天

Coding Form for Input and Use of Daily Values--Continued

85090360 Willow

Station Identification number

Water year 1979

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Ф  
М  
О.  
Д.

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	NO RECORD 6.0 6.9 5.9 5.7 5.6						1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
9	NO RECORD						9							9
10							10							10
11							11							11
12							12							12
13							13							13
14							14							14
15							15							15
16							16							16
17							17						17	
18							18						18	
19							19						19	
20							20						20	
21							21						21	
22							22						22	
23							23						23	
24							24						24	
25							25						25	
26							26						26	
27							27						27	
28							28						28	
29							29						29	
30					-----		30						30	
31		-----			-----		31	-----		-----			-----	31

Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Type

Water year

Total value (sum of daily value entries)

00300

Stat Code 0001

**Preliminary Record  
Subject to Revision**

Remarks

Water year 1978

Willow Co.

09306055

Station identification number

DO

MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	NO DATA	8.7	NO DATA	9.0	4.8	6.1	1	8.8	NO DATA		NO DATA	5.5	NO DATA	1
2		8.2	9.6	9.3	5.4	6.5	2	10.0				4.5	↑	2
3		8.1	9.4	6.7	5.5	6.4	3	10.2				1.6		3
4		8.0	9.3	6.5	4.2	6.6	4	9.8				2.9	↓	4
5		7.8	9.5	10.2	4.4	6.2	5	9.5				3.7	NO DATA	5
6		7.7	9.8	10.1	3.9	7.1	6	9.6				2.5	5.4	6
7		7.7	10.0	7.9	3.9	NO DATA	7	9.2				0.0	5.7	7
8		7.3	10.5	7.5	4.0	7.0	8	9.5	NO DATA			2.1	5.1	8
9		4.1	8.4	7.2	10.3	7.2	9	5.6				1.9	NO DATA	9
10		7.7	10.3	6.3	10.4	6.9	10	5.8				2.8	1	10
11		7.8	10.3	6.3	10.4	6.0	11	NO DATA				3.2	NO DATA	11
12		NO DATA	10.5	7.0	7.0	6.4	12					2.8	7.1	12
13		7.6	10.1	6.3	7.0	6.4	13			NO DATA		2.4	6.5	13
14		7.7	9.7	NO DATA	5.6	6.5	14			5.3		2.8	6.6	14
15		9.4	9.6	NO DATA	6.5	7.2	15			5.4		1.5	5.7	15
16		9.5	7.4	NO DATA	6.3	7.6	16			5.2		6.9	6.1	16
17		9.6	6.0	6.4	5.8	7.1	17			4.8		7.1	6.5	17
18		9.5	5.6	6.6	5.8	6.6	18			NO DATA	NO DATA	6.9	6.1	18
19		7.3	6.6	NO DATA	6.6	8.6	19			NO DATA	NO DATA	6.6	5.7	19
20		NO DATA	7.2	4.7	6.2	8.7	20			6.4		7.0	5.4	20
21		NO DATA	6.5	NO DATA	10.2	6.9	21			6.4		6.9	5.3	21
22		8.8	6.3	5.0	10.1	8.8	22			NO DATA		6.6	5.3	22
23		8.9	6.3	4.7	10.0	8.7	23			NO DATA		6.0	4.4	23
24	NO DATA	9.2	6.7	4.7	6.2	6.8	24			6.4		6.5	4.3	24
25	8.1	8.4	7.0	4.8	4.5	7.0	25			NO DATA		6.8	4.3	25
26	8.0	7.6	5.5	7.7	6.9	5.2	26			1.1		6.4	4.1	26
27	5.0	5.3	5.7	8.0	6.2	6.1	27			4.6		6.9	4.0	27
28	7.9	5.2	8.7	5.5	6.1	8.2	28		NO DATA	4.1		6.9	3.9	28
29	7.9	NO DATA	8.4	4.9	-----	9.2	29		NO DATA	1.2		6.9	3.6	29
30	8.0	8.1	8.5	4.7	-----	NO DATA	30		NO DATA	NO DATA		7.6	NO DATA	30
31	8.6	-----	8.7	4.9	-----	3.6	31		NO DATA	-----		7.0	-----	31

TOTAL CHECK CARD

Type T 1  
Water year 1978 20

Total value (sum of daily value entries)  
21 32

Bar Code 000000  
Total Code 000000

Preliminary Record  
Subject to Revision

Remarks



D.O.  
MIR

Coding Form for Input and Update of Daily Values--Continued

Station Identification number 09306058 Willow Cr. Water year 1979 D.O. MIRS

DAY		OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1	4.2						1							1
	2	4.2						2							2
	3	4.2						3							3
	4	4.2						4							4
	5	4.2						5							5
	6	3.9						6							6
	7	3.7						7							7
	8	3.6						8							8
Card No. 02	9							9							9
	10							10							10
	11							11							11
	12							12							12
	13							13							13
	14							14							14
	15							15							15
	16							16							16
Card No. 03	17							17							17
	18							18							18
	19							19							19
	20							20							20
	21							21							21
	22							22							22
	23							23							23
	24							24							24
Card No. 04	25							25							25
	26							26							26
	27							27							27
	28							28							28
	29							29							29
	30							30							30
	31							31							31

TOTAL CHECK CARD

Type T

Water year 1979

Total value (sum of daily value entries) 21 32

Bar Code 00300  
Date Code 00002

Subject to Review  
Per Administrative  
In Control

Remarks



# Coding Form for Input and Use of Daily Values--Continued

Station Identification number 09306058 Willow Cr Water year 1978 DO. mean

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	No DATA	8.2	7.6	10.0	6.7	7.1	1	9.8	No data	No data	No data	7.2	No data	1
2		9.0	10.0	10.0	10.1	7.1	2	10.6				6.8		2
3		8.8	9.7	8.4	9.6	8.3	3	10.8				6.3		3
4		8.7	9.7	9.3	8.8	8.5	4	10.7				6.8		4
5		8.5	9.8	10.4	9.3	ND	5	10.6				6.6	No data	5
6		8.3	10.0	10.3	8.4	7.1	6	10.5				5.7	No data	6
7		8.3	10.3	10.4	7.5	7.2	7	10.3				4.7	7.4	7
8		8.0	10.8	8.9	7.7	7.7	8	9.4	No data			4.9	6.9	8
9		6.6	10.0	8.5	10.9	9.3	9	6.7				4.4	No data	9
10		9.1	10.7	7.9	10.8	9.1	10	6.9				4.8	No data	10
11		8.7	10.8	6.8	10.7	7.0	11	No data				4.4	No data	11
12		No DATA	10.7	8.9	9.7	7.0	12					3.5	8.2	12
13		8.4	10.7	9.0	8.8	7.2	13					3.4	7.9	13
14		7.8	10.1	7.4	7.0	7.3	14					3.5	7.6	14
15		7.8	9.9	No DATA	8.8	9.2	15					3.6	7.0	15
16		10.0	10.0	No DATA	7.8	9.4	16					8.5	7.2	16
17		10.1	6.9	7.5	9.8	10.0	17					9.4	7.0	17
18		7.8	6.0	7.3	9.2	7.6	18					8.7	6.9	18
19		9.8	7.6	6.9	7.7	9.1	19					9.5	6.8	19
20		No DATA	8.7	No DATA	7.1	9.6	20					9.1	6.6	20
21		No DATA	8.3	No DATA	10.7	9.5	21					8.7	6.5	21
22		9.3	6.9	7.7	11.0	8.9	22					8.4	6.6	22
23		9.6	7.8	6.9	10.9	8.9	23					8.3	5.9	23
24	No DATA	9.6	7.3	8.2	10.0	9.7	24					8.8	5.5	24
25	8.6	9.0	9.7	6.7	8.2	9.1	25					8.8	5.4	25
26	8.9	8.5	9.6	8.7	7.4	9.0	26					8.8	5.2	26
27	8.7	8.8	9.2	8.7	6.9	8.8	27					9.3	5.0	27
28	8.8	9.4	9.1	8.3	7.3	8.5	28					9.3	5.0	28
29	8.7	8.1	8.7	6.9	--	10.1	29					8.9	4.6	29
30	8.6	10.0	8.7	6.8	-----		30	No data				9.0	No data	30
31	9.0	-----	9.4	7.2	-----	7.0	31	-----				9.5	-----	31

TOTAL CHECK CARD

Type T 1

Water year 1978 17 20

Total value (sum of daily value entries) 21 32

Bar Code 00302  
Stat Code 00003

Preliminary Record  
Subject to Revision  
D.O. mean

Remarks

WILLOW CR.

Coding Form for Input and Maintenance of Daily Values--Continued

09306053 WILLOW CR.

Station identification number

Water year 1979

D.O. MEAN

DAY		OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1							1							1
	2							2							2
	3							3							3
	4							4							4
	5	5.1						5							5
	6	5.0						6							6
	7	5.0						7							7
	8	4.7						8							8
Card No. 02	9	4.6						9							9
	10							10							10
	11							11							11
	12							12							12
	13							13							13
	14							14							14
	15							15							15
	16							16							16
Card No. 03	17							17							17
	18							18							18
	19							19							19
	20							20							20
	21							21							21
	22							22							22
	23							23							23
	24							24							24
Card No. 04	25							25							25
	26							26							26
	27							27							27
	28							28							28
	29							29							29
	30							30							30
	31							31							31

TOTAL CHECK CARD

Type T 1 Water year 1979 17 20

Total value (sum of daily value entries) 21 32

Per Code 00300  
Data Code 00003

Preliminary Record  
Subject to Revision

Remarks



Station Identification number 07306058 Willowick Water year 1978 PH MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	No Data	No Data	8.7	No Data	8.1	7.8	1	8.2	No Data	No Data	8.5	8.0	8.2	1
2			8.0		8.0	7.8	2	8.1			8.5	8.0	7.0	2
3			8.1	No Data	8.2	8.4	3	8.0			8.5	8.0		3
4			8.6	8.8	8.1	8.4	4	8.0			8.2	8.0		4
5			8.6	8.9	8.2	8.0	5	7.9			8.5	8.0	7.0	5
6			8.2	8.9	8.1	7.0	6	7.9			8.5	8.0	8.2	6
7			8.5	8.9	8.1	1	7	8.0			8.5	8.2	8.2	7
8			7.9	8.9	8.1	No Data	8	7.0	No Data		8.5	8.1	8.1	8
9			No Data	8.9	8.5	8.2	9				8.6	8.0	8.1	9
10			8.5	8.7	8.4	8.2	10				8.6	8.0	8.1	10
11			8.4	8.5	8.4	7.9	11				8.5	8.0	8.1	11
12			8.3	8.9	8.4	No Data	12				8.5	8.0	8.1	12
13			No Data	8.9	8.3	1	13				8.4	8.0	8.1	13
14				8.9	7.9	No Data	14				No Data	8.3	8.1	14
15				8.1	8.3	8.2	15				8.2	8.0	8.0	15
16				8.7	8.3	8.1	16				8.2	8.0	8.0	16
17				8.5	8.3	8.3	17				8.5	8.0	8.1	17
18				8.2	8.2	7.0	18				8.5	8.0	8.0	18
19				8.4	8.2	No Data	19				8.5	8.0	8.1	19
20				8.1	7.8	8.6	20				8.5	8.0	8.0	20
21				8.2	8.1	8.2	21				8.5	8.2	8.1	21
22				8.1	8.5	8.5	22				8.4	8.2	8.1	22
23				8.0	8.4	8.2	23				No Data	8.2	8.1	23
24	No Data			8.2	7.4	No Data	24				8.5	8.2	8.1	24
25				8.2	8.0	1	25				8.2	8.2	8.1	25
26				8.0	7.9	1	26				8.2	8.2	8.1	26
27				8.0	7.9	1	27				8.2	8.3	8.1	27
28				8.2	7.9	No Data	28				8.2	8.3	8.1	28
29				8.1	8.1	8.4	29				8.1	8.3	8.2	29
30				7.7	8.1	8.0	30				8.2	8.3	7.0	30
31	No Data			8.0	8.1	7.0	31				8.1	8.2	8.2	31

TOTAL CHECK CARD

Type T 1 1978 20

Water year 1978

Total value (sum of daily value entries) 21 32

Station Code 00400

Water Code 00000

Preliminary Record Subject to Revision

Remarks



max

Coding Form for Input and Update of Daily Values--Continued

09306053 Willow Cr.

Station identification number

Water year

1979

PH MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
9							9							9
10							10							10
11							11							11
12							12							12
13							13							13
14							14							14
15							15							15
16							16							16
17							17							17
18							18							18
19							19							19
20							20							20
21							21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type

T

Water year

1979

Total value (sum of daily value entries)

21 32

Par Code

00402

State Code

00001

Subject to Revision  
Preliminary Record

Remarks

1978

Water year

09306058

Station identification number

Card No. 01

Card No. 02

Card No. 03

Card No. 04

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	No DATA	No DATA	7.2	No DATA	7.2	7.7	1	No DATA	No DATA	No DATA	8.2	7.8	No DATA	1
2			7.8		No DATA	7.7	2	8.0			8.1	7.8	No DATA	2
3			7.7			7.8	3	8.0			8.2	7.4	No DATA	3
4			7.5	No DATA		No DATA	4	7.9			8.2	7.9		4
5			8.1				5	7.8			8.2	7.8	No DATA	5
6			7.3				6	7.7			8.2	7.8	8.0	6
7			7.4				7	7.7			7.7	7.8	8.0	7
8			7.4				8	No DATA	No DATA		7.7	7.8	8.0	8
9			No DATA		No DATA	No DATA	9				7.8	7.8	8.0	9
10			7.9		8.3	7.6	10				7.8	7.8	8.0	10
11			7.7		8.3	7.6	11				7.8	7.8	8.0	11
12			8.1		8.0	No DATA	12				8.2	7.8	8.0	12
13			No DATA		7.9	7.8	13				8.2	7.8	8.0	13
14			8.4		7.8	7.8	14				No DATA	7.8	8.0	14
15			8.2		7.9	7.8	15				8.2	7.8	8.0	15
16			8.3		7.9	7.8	16				8.2	7.8	8.0	16
17			7.8		7.7	7.9	17				8.1	7.8	8.0	17
18			7.8		7.9	No DATA	18				No DATA	7.8	8.0	18
19			7.7		7.8	7.8	19				7.8	7.8	8.0	19
20			7.6		7.7	7.7	20				8.2	7.8	8.0	20
21			No DATA		8.3	8.3	21				8.3	7.9	8.0	21
22					8.3	8.3	22				8.2	8.0	8.0	22
23					8.3	8.3	23				No DATA	8.0	8.0	23
24					7.9	7.9	24				No DATA	8.0	8.0	24
25					7.8	7.8	25				8.0	8.0	8.0	25
26					7.5	7.5	26				8.0	8.0	8.0	26
27					7.8	7.8	27				8.0	8.0	8.0	27
28					7.8	7.8	28				8.0	8.1	8.0	28
29					7.8	7.8	29				8.0	8.0	8.0	29
30					7.8	7.8	30				7.8	8.1	8.0	30
31					7.8	7.8	31				7.9	8.0	8.0	31

TOTAL CHECK CARD

Type ☒ T ☐ W

Water year 1978

1 17 20 32

Total value (sum of daily value entries) 21 32

Preliminary Record  
Subject to Revision

Bar Code 00400  
Bar Code 00000

Remarks



ph.  
min

Coding Form for Input and State of Daily Values--Continued

09306058 Willow Cr.

Station identification number

Water year 1979

PH MIN

CARD NO.	DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1	7.9						1							1
	2							2							2
	3							3							3
	4	8.0						4							4
	5	7.9						5							5
	6	8.0						6							6
	7	7.9						7							7
	8	7.9						8							8
	9	7.9						9							9
Card No. 02	10	7.9						10							10
	11	7.9						11							11
	12	7.9						12							12
	13	7.9						13							13
	14	7.9						14							14
	15	7.9						15							15
	16	7.9						16							16
	17	7.9						17							17
	18	7.9						18							18
Card No. 03	19	7.9						19							19
	20	7.9						20							20
	21	7.9						21							21
	22	7.9						22							22
	23	7.9						23							23
	24	7.9						24							24
	25							25							25
	26							26							26
	27							27							27
Card No. 04	28							28							28
	29							29							29
	30							30							30
	31							31							31

TOTAL CHECK CARD

Type T 1  
Water year 1979  
17 20

Total value (sum of daily value entries)  
21 32

Max Value 20400  
Stat Code 20224

Preliminary Record  
Subject to Revision

Remarks



Station Identification number

09306058

Willow Creek

Water year

1978

PH MENT

CARD NO.	DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1	No DATA	No DATA	8.0	No DATA	7.8	7.7	1	No DATA	No DATA	No DATA	8.1	8.0	8.1	1
	2			7.9		No DATA	7.8	2	8.0			8.3	8.0	7.0 8.1	2
	3			8.0				3	8.0			8.3	7.9		3
	4			8.4	No DATA			4	8.0			8.2	7.9		4
	5			8.4				5	7.9			8.3	7.9	7.0 8.1	5
	6			7.8				6	7.8			8.4	7.9	8.1	6
	7			7.8				7	7.8			8.4	7.9	8.1	7
	8			7.7				8	No DATA			8.4	7.9	8.0	8
Card No. 02	9			No DATA		No DATA	No DATA	9				8.5	7.9	8.0	9
	10			8.2		8.3	7.9	10				8.4	7.9	8.0	10
	11			8.3		8.3	7.6	11				8.3	7.9	8.0	11
	12			8.3		8.2	No DATA	12				8.4	7.9	8.0	12
	13			8.3		8.0		13			No DATA	8.3	7.9	8.0	13
	14			No DATA		7.9	No DATA	14			8.3	No DATA	8.0	8.0	14
	15			8.4		8.0	7.8	15			8.3		7.9	8.0	15
	16			8.3		7.9	8.0	16			8.3		7.9	8.0	16
Card No. 03	17			7.9		8.0	7.1	17			8.2		7.9	8.0	17
	18			7.9		8.0	No DATA	18			8.1	No DATA	7.9	8.0	18
	19			7.7		8.0		19			8.0		8.0	8.0	19
	20			8.2		7.8		20			No DATA	8.4	7.9	8.0	20
	21			No DATA		7.5		21			No DATA	8.4	8.0	8.0	21
	22					8.4		22				8.3	8.1	8.0	22
	23					8.4		23				No DATA	8.1	8.0	23
	24	No DATA			No DATA	8.2		24				8.3	8.1	8.0	24
Card No. 04	25			7.9		7.9		25				8.1	8.1	8.0	25
	26			No DATA		7.9		26			No DATA	8.2	8.1	8.0	26
	27			7.9		7.8		27			8.2	8.1	8.2	8.0	27
	28			No DATA		7.8		28				8.1	8.2	8.0	28
	29			No DATA				29			No DATA	8.1	8.2	8.0	29
	30			7.8			7.9	30			8.5	8.1	8.2	7.0 8.1	30
	31	No DATA			7.8			31				8.0	8.2		31

TOTAL CHECK CARD

Type

T

Water year

1978

Total value (sum of daily value entries)

21

Par Code 00400

Stat Code 00003

Preliminary Record  
Subject to Revision  
PHM:JW

Remarks

mean

Coding Form for Input and Use of Daily Values--Continued

09306058 Willow Cr.

Station identification number

Water year 1979

P# MEH1

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
9							9							9
10							10							10
11							11							11
12							12							12
13							13							13
14							14							14
15							15							15
16							16							16
17							17							17
18							18							18
19							19							19
20							20							20
21							21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type

T

Water year

1979

Total value (sum of daily value entries)

21 32

Stat Code 00003

Preliminary Record

Subject to Revision

Remarks



Station identification number 09306058 Water year 1978 Willow Cr CORD MAX

CARD NO.	DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1	No DATA	1278	1316	No DATA	1520	1274	1		No DATA	11/1/1	1852		1212	1
	2		1274	1270		No DATA	1264	2				1452		71065	2
	3		1276	1266		1366	1266	3				1244			3
	4		1274	1268		1370	No DATA	4				1734			4
	5		1272	1292		1372		5				1734		No DATA	5
	6		1264	1374		1570		6				1840		1322	6
	7		1268	1344		1428		7				1882		1316	7
Card No. 02	8		1300	1310		1530	No DATA	8		No DATA		1734		1316	8
	9		1212	1328		1248	1446	9				1718		1324	9
	10		1252	1292		1324	1454	10				1714		1332	10
	11		1306	1300		1324	1472	11				1730		1330	11
	12		No DATA	1254		1222	No DATA	12				1730		1528	12
	13		1276	1328		1416	1480	13			No DATA	1728		1320	13
	14		1254	1284		1446	1404	14			1716	1502		1346	14
Card No. 03	15		1264	1282		1430	1480	15			1716	No DATA		1314	15
	16		1282	1292		1426	1460	16			1746	1794		1442	16
	17		1258	No DATA	1328	1340	No DATA	17			1712	1808		1426	17
	18		1274		1350	No DATA		18			1718	No DATA		1400	18
	19		1274		No DATA	1434		19			1734	1702		1418	19
	20		1208			1448	No DATA	20			1734	1732		1410	20
	21		1242		No DATA	1416	1438	21			No DATA	1648		1398	21
Card No. 04	22		No DATA		1338	1298	No DATA	22				1728		1394	22
	23				No DATA	1410	1400	23				1952		1390	23
	24		No DATA		No DATA	1368		24				1828		1502	24
	25		1250		No DATA	1364		25			No DATA	No DATA		1394	25
	26		1274		No DATA	1364		26			1698	124		1394	26
	27		1270	No DATA	1244	1364		27			1570			1320	27
	28		1268	1264	1258	1368		28			1510			1324	28
	29		1266	1334	No DATA	1400		29			1510			1466	29
	30		1264	1304	No DATA	-----		30			1510			No DATA	30
	31		1274	-----	No DATA	-----		31			1620			1188	31
											-----				

TOTAL CHECK CARD

Type T Water year 1978

Total value (sum of daily value entries) 21 32

PRELIMINARY RECORD  
Subject to Revision

Remarks





Station identification number

09306058

Willow Cr

1974

Good morning

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	No DATA	12446	12444	No DATA	No DATA	12444	1	No DATA	1338	No DATA	9770			1
2		12444	12337			12444	2	1338			No DATA			2
3		12442	12447			12447	3	1290			980			3
4		12338	12446			No DATA	4	No DATA			12448			4
5		12246	12546				5				11416		70000	5
6		11246	12346				6				No DATA		1240	6
7		1208	12546				7				1084		1220	7
8		1260	11244				8				1010		1234	8
9			No DATA		No DATA	No DATA	9				976		1234	9
10		11442	1252		1198	1250	10				No DATA		1236	10
11		1222	1170		1166	1244	11						1268	11
12		No DATA	1256		1126	1300	12				No DATA		1272	12
13		1236	1022		No DATA	1252	13				8416		1260	13
14		1222	1256			1242	14				No DATA		1250	14
15		1242	1216		No DATA	No DATA	15						1248	15
16		1250	No DATA	No DATA	1222	1192	16						1248	16
17		1244		1240	1184	1184	17					No DATA	1246	17
18		1242		1224	1152	No DATA	18				No DATA	1056	1330	18
19		1192		No DATA	1138		19				1100	1084	1316	19
20		1226			1308		20				No DATA	1020	1302	20
21		No DATA			1184		21				1236	No DATA	1306	21
22					1128		22				No DATA	No DATA	1308	22
23					1108		23					1048	1298	23
24	No DATA				1120		24				No DATA	914	1304	24
25	1222				1100		25					912	1304	25
26	1228			No DATA	1144		26					852	1298	26
27	1226			1120	1140		27					804	1296	27
28	1222	No DATA		No DATA	1144		28					No DATA	1296	28
29	1212	1226		No DATA	-		29		No Flow	No DATA			1306	29
30	1216	No DATA		1276	-----		30		No DATA	1056			No DATA	30
31	1242	-----	No DATA	1146	-----		31		No DATA	1084			-----	31

TOTAL CHECK CARD

Type	T	17	20
Water year	1978		

Total value (sum of daily value entries)	21	22
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2000000000  
5600000000

Preliminary Record  
Subject to Revision

Remarks



min

Coding Form for Input and State of Daily Values--Continued

1979

Station identification number

09206058 Willow Cr.

Water year

CD100 11/1

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4	1284						4							4
5	1284						5							5
6	1286						6							6
7	1276						7							7
8	1288						8							8
9	1286						9							9
10	1294						10							10
11	1302						11							11
12	1298						12							12
13	1310						13							13
14	1310						14							14
15	1312						15							15
16	1306						16							16
17	1302						17							17
18	1316						18							18
19	1320						19							19
20	1326						20							20
21	1314						21							21
22	1314						22							22
23	1318						23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type

T

Water year

1979

Total value (sum of daily value entries)

21 32

Par Code 0000

Stat Code 0000

Preliminary Record  
Subject to Revision

Remarks



Station identification number 02306058

Willow Cr.

Water year 1978

COND MEAN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	NO DATA	1269	1255	NO DATA	NO DATA	1234	1	1481	NO DATA	NO DATA	1290			1
2		1265	1254			1230	2				1094			2
3		1261	1250			1227	3	1458			1441			3
4		1258	1257			NO DATA	4	NO DATA			1558			4
5		1253	1271				5				1440			5
6		1233	1293				6				1167			6
7		1250	1250				7				1457			7
8		1272	1268				8		NO DATA		1358			8
9		1272	NO DATA		NO DATA	NO DATA	9				1256			9
10		1268	1272		1257	1246	10				1118			10
11		1265	1267		1242	1232	11				NO DATA			11
12		NO DATA	1270		1181	1290	12				1241			12
13		1257	1264		1231	1240	13				1299			13
14		1242	1270		1293	1248	14				NO DATA			14
15		1251	1256		1248	1212	15				1454			15
16		1267	NO DATA		1275	1209	16				1216			16
17		1268	NO DATA		1251	NO DATA	17				1196			17
18		1259			1277		18				NO DATA			18
19		1242			1273		19				1368			19
20		1278			1365		20				1231			20
21		NO DATA			1278		21				1236			21
22					1234		22				1233			22
23					1215		23				1233			23
24	NO DATA				1234		24				NO DATA			24
25	1242				1219		25				NO DATA			25
26	1253			NO DATA	1290		26				1093			26
27	1251			1233	1255		27				995			27
28	1242	NO DATA		NO DATA	1292		28				958			28
29	1242	1280		1120			29				NO DATA			29
30	1251	1169		1345			30				1113			30
31	1250		NO DATA	1319			31				1278			31

TOTAL CHECK CARD

Type T Water year 1978

Total value (sum of daily value entries)

NO DATA 000003

Preliminary Record  
Subject to Revision

COND MEAN

Remarks

100306053

Coding Form for Input and Use of Daily Values--Continued

Station identification number

100306053

WILLOW CR.

Water year 1979

COND MC/AN

DAY		OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1							1							1
	2							2							2
	3							3							3
	4	1327						4							4
	5	1326						5							5
	6	1329						6							6
	7	1329						7							7
Card No. 02	8	1330						8							8
	9	1329						9							9
	10	1330						10							10
	11	1330						11							11
	12	1328						12							12
	13	1334						13							13
	14	1332						14							14
Card No. 03	15	1337						15							15
	16	1329						16							16
	17	1336						17							17
	18	1336						18							18
	19	1336						19							19
	20	1356						20							20
	21	1350						21							21
Card No. 04	22	1336						22							22
	23	1338						23							23
	24							24							24
	25							25							25
	26							26							26
	27							27							27
	28							28							28
	29							29							29
	30							30							30
	31							31							31

TOTAL CHECK CARD

Type ☒ T ☐ 1  
Water year 1979 20

Total value (sum of daily value entries)  
21 32

Par Code 00025  
Stat Code 00003

Preliminary Record  
Subject to Revision

Remarks



Section Identification number

09306055

Willow Creek

Water year

1920

Temp

W 17 X

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	No DATA	6.1	6.5	No DATA	No DATA	9.1	1	23.3	No DATA	No DATA	25.8	21.2	17.6	1
2		8.0	5.3			7.5	2	13.9			24.4	26.3	No DATA	2
3		8.7	5.6			9.5	3	11.7			24.1	26.9		3
4		2.3	5.5	No DATA		No DATA	4	15.1			19.8	26.0		4
5		10.2	4.7	4.0		↑	5	13.2			23.6	26.2	↑	5
6		5.0	2.7	3.3			6	15.3			25.4	25.1	↑	6
7		9.1	4.3	2.9			7	17.1			26.1	26.4	↑	7
8		4.9	3.4	2.1		✓	8	No DATA	No DATA		26.9	25.7	↑	8
9		2.0	No DATA	4.3	No DATA	No DATA	9	13.6			23.1	26.4	↑	9
10		4.0	5.8	5.0	6.3	9.6	10	No DATA			23.6	23.4	↑	10
11		5.2	5.3	5.7	5.6	10.1	11	5			23.1	19.3	↑	11
12		No DATA	4.6	4.0	2.5	6.6	12				27.2	24.2	↑	12
13		6.1	3.4	4.7	6.9	9.4	13			No DATA	27.2	19.1	↑	13
14		6.0	6.1	6.0	7.2	7.6	14			23.0	26.5	14.7	↑	14
15		7.0	6.5	7.2	5.2	8.6	15			24.2	24.2	22.1	↑	15
16		7.0	No DATA	8.2	6.7	9.4	16			23.8	24.7	21.7	↑	16
17		6.0		6.3	4.0	13.6	17			24.1	23.7	22.3	↑	17
18		6.2		6.1	7.5	10.3	18			25.1	24.9	19.6	↑	18
19		3.5		No DATA	7.2	↑	19			26.1	22.3	21.9	↑	19
20		4.5			7.9		20			23.0	25.1	20.7	↑	20
21		No DATA			4.4		21			23.5	23.0	20.2	↑	21
22					9.9		22			24.4	25.3	18.8	↑	22
23					8.5		23			25.0	27.3	23.0	↑	23
24	No DATA				7.8		24			25.9	26.6	21.4	↑	24
25	11.3				7.7		25			22.9	26.9	20.6	↑	25
26	11.2			No DATA	9.0		26			23.6	27.3	21.7	↑	26
27	10.5			5.7	9.5		27			20.7	24.0	20.8	↑	27
28	11.0	No DATA		No DATA	4.0		28			20.3	22.5	20.1	↑	28
29	7.4	6.2		No DATA	-	↑	29		No DATA	16.5	21.1	19.9	↑	29
30	8.3	7.9		7.7	-----	No DATA	30	No DATA		20.4	24.1	17.4	↑	30
31	4.0	-----	No DATA	6.2	-----	No DATA	31	-----	No DATA	-----	21.0	18.7	-----	31

TOTAL CHECK CARD

Type	Water year
1	1955-56
2	1956-57
3	1957-58
4	1958-59
5	1959-60
6	1960-61
7	1961-62
8	1962-63
9	1963-64
10	1964-65
11	1965-66
12	1966-67
13	1967-68
14	1968-69
15	1969-70
16	1970-71
17	1971-72
18	1972-73
19	1973-74
20	1974-75
21	1975-76
22	1976-77
23	1977-78
24	1978-79
25	1979-80
26	1980-81
27	1981-82
28	1982-83
29	1983-84
30	1984-85
31	1985-86
32	1986-87
33	1987-88
34	1988-89
35	1989-90
36	1990-91
37	1991-92
38	1992-93
39	1993-94
40	1994-95
41	1995-96
42	1996-97
43	1997-98
44	1998-99
45	1999-00
46	2000-01
47	2001-02
48	2002-03
49	2003-04
50	2004-05
51	2005-06
52	2006-07
53	2007-08
54	2008-09
55	2009-10
56	2010-11
57	2011-12
58	2012-13
59	2013-14
60	2014-15
61	2015-16
62	2016-17
63	2017-18
64	2018-19
65	2019-20
66	2020-21
67	2021-22
68	2022-23
69	2023-24
70	2024-25
71	2025-26
72	2026-27
73	2027-28
74	2028-29
75	2029-30
76	2030-31
77	2031-32
78	2032-33
79	2033-34
80	2034-35
81	2035-36
82	2036-37
83	2037-38
84	2038-39
85	2039-40
86	2040-41
87	2041-42
88	2042-43
89	2043-44
90	2044-45
91	2045-46
92	2046-47
93	2047-48
94	2048-49
95	2049-50
96	2050-51
97	2051-52
98	2052-53
99	2053-54
100	2054-55
101	2055-56
102	2056-57
103	2057-58
104	2058-59
105	2059-60
106	2060-61
107	2061-62
108	2062-63
109	2063-64
110	2064-65
111	2065-66
112	2066-67
113	2067-68
114	2068-69
115	2069-70
116	2070-71
117	2071-72
118	2072-73
119	2073-74
120	2074-75
121	2075-76
122	2076-77
123	2077-78
124	2078-79
125	2079-80
126	2080-81
127	2081-82
128	2082-83
129	2083-84
130	2084-85
131	2085-86
132	2086-87
133	2087-88
134	2088-89
135	2089-90
136	2090-91
137	2091-92
138	2092-93
139	2093-94
140	2094-95
141	2095-96
142	2096-97
143	2097-98
144	2098-9

Water year 1978 17 20

Total value (sum of daily value entries)

Total value (sum of daily value entries)	21	32
--	----	----

2022 0000 00010

2025 RELEASE UNDER E.O. 14176

Preliminary Record  
Subject to Revision

Remarks



1111X  
TEMP 1111X

Coding Form for Input and State of Daily Values--Continued  
99306058 Willow Cr. 1979

Station identification number

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
9							9							9
10							10							10
11							11							11
12							12							12
13							13							13
14							14							14
15							15							15
16							16							16
17							17							17
18							18							18
19							19							19
20							20							20
21							21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Type T 1  
Water year 1979 17 20

Total value (sum of daily value entries)  
21 32

Par Code 00010  
State Code 00001

Preliminary Record  
Subject to Revision

Remarks

Station identification number

09306058

Willow Creek

Water year

1978

TEMP MIN

CARD NO.	DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1	No DATA	0.0	0.6	No DATA	2.2	5.8	1	5.6	No DATA	No DATA	8.2	9.7	7.8	1
	2		0.1	1.2		No DATA	4.8	2	4.8			9.0	7.8	No DATA	2
	3		0.9	3.2		0.7	0.1	3	4.1			6.0	8.4	7	3
	4		2.0	2.5	No DATA	No DATA	0.3	4	3.3			No DATA	6.8		4
	5		2.8	0.1	1.4		No DATA	5	5.1			11.1	6.0	No DATA	5
	6		4.2	0.1	1.5			6	4.6			7.5	6.9	7.9	6
	7		4.2	0.1	0.1			7	3.8			9.6	4.0	8.6	7
	8		0.0	0.1	0.1	No DATA		8	No DATA			4.0	9.0	7.3	8
Card No. 02	9		0.0	0.1	1.7	0.1	No DATA	9	5.6			7.2	8.5	6.2	9
	10		0.1	0.4	3.3	2.8	2.7	10	No DATA			8.9	9.3	6.8	10
	11		0.0	0.1	2.4	1.3	5.6	11	1			No DATA	8.7	8.0	11
	12		No DATA	0.6	1.0	0.1	0.4	12				8.6	10.1	6.0	12
	13		0.0	0.1	0.1	0.3	5.2	13			No DATA	5.8	10.6	3.4	13
	14		5.0	1.2	0.1	3.1	4.9	14				6.7	2.3	3.6	14
	15		2.3	2.3	3.9	0.3	0.4	15				No DATA	4.6	6.3	15
	16		0.1	0.1	1.5	2.5	0.4	16				5.4	8.8	5.5	16
Card No. 03	17		0.1	No DATA	3.8	0.1	1.5	17				No DATA	6.0	4.6	17
	18		3.3		3.1	0.2	No DATA	18				13.2	5.2	4.9	18
	19		0.1		0.2	1.1	1.7	19				12.5	8.4	2.2	19
	20		0.5		No DATA	4.6	5.1	20				9.5	6.6	3.4	20
	21		1.5		No DATA	0.6	3.1	21				7.2	8.5	4.2	21
	22		No DATA		1.0	0.1	4.0	22				7.2	11.4	4.9	22
	23				1.7	0.1		23				13.1	9.2	5.0	23
	24	No DATA			0.5	0.0		24				9.1	9.1	4.6	24
Card No. 04	25	5.6			2.5	2.9		25			No DATA	14.2	9.0	4.3	25
	26	2.6			1.2	4.3		26			5.1	9.4	6.9	5.0	26
	27	1.6			1.9	4.6		27			6.3	7.3	5.1	4.8	27
	28	4.6	No DATA		0.6	2.9	No DATA	28			9.0	12.6	5.1	3.3	28
	29	5.0	0.1		2.5		6.6	29		No DATA	7.7	11.5	6.3	4.0	29
	30	5.2	0.1		3.0		5.4	30		No DATA	8.3	9.6	6.2	No DATA	30
	31	4.3		No DATA	1.8		No DATA	31		No DATA		8.1	8.7		31

TOTAL CHECK CARD

Type

T

Water year

1978

Total value (sum of daily value entries)

21

Data Code

00010

Preliminary Record  
Subject to Revision

Remarks



NO 1111

Coding Form for Input and  
te of Daily Values--Continued

Willow Cr.  
09306058 Co

Station identification number

Water year

2201

TEMP 112

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	2.0						1							1
2	2.0						2							2
3							3							3
4	1.5						4							4
5	2.7						5							5
6	2.8						6							6
7	3.1						7							7
8	2.9						8							8
9	3.4						9							9
10	3.5						10							10
11	1.7						11							11
12	1.0						12							12
13	1.4						13							13
14	1.8						14							14
15	3.1						15							15
16	6.9						16							16
17	2.4						17							17
18	3.5						18							18
19	7.1						19							19
20	5.9						20							20
21	1.0						21							21
22	1.6						22							22
23	4.5						23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type

Water year

1979

17	20
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Total value (sum of daily value entries)

[illegible][illegible]

Pat Code 00000

Stat Code 00002-

Preliminary Record  
Subject to Revision

Remarks





011-111

Coding Form for Input and e of Daily Values--Continued

09306053 Willow Cr.

Station identification number

Water year

1979

TEMP 11.000

DAY		OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1	6.5						1							1
	2	7.0						2							2
	3	7.0						3							3
	4	7.0						4							4
	5	7.0						5							5
	6	7.0						6							6
	7	7.0						7							7
	8	7.0						8							8
Card No. 02	9	7.0						9							9
	10	7.0						10							10
	11	7.0						11							11
	12	7.0						12							12
	13	7.0						13							13
	14	7.0						14							14
	15	7.0						15							15
	16	7.0						16							16
Card No. 03	17	7.0						17							17
	18	7.0						18							18
	19	7.0						19							19
	20	7.0						20							20
	21	7.0						21							21
	22	7.0						22							22
	23	7.0						23							23
	24	7.0						24							24
Card No. 04	25	7.0						25							25
	26	7.0						26							26
	27	7.0						27							27
	28	7.0						28							28
	29	7.0						29							29
	30	7.0						30							30
	31	7.0						31							31

TOTAL CHECK CARD

Type

T 1

Water year

1979 20

Total value (sum of daily value entries)

21 32

Par Code 11112

Stat Code 00000

Preliminary Record  
Subject to Revision.

Remarks

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306058 - WILLOW CREEK NEAR RIO BLANCO, CO.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	TEMPER- ATURE (DEG C)	CODE FOR AGENCY ANAL- YZING SAMPLE	WEATHER *	SURFACE AREA (SQUARE MILES)	COLOR (PLAT- INUM- COBALT UNITS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	DIS- SOLVED OXYGEN (MG/L)	CHEM- ICAL OXYGEN DEMAND (HIGH LEVEL) (MG/L)	PH (UNITS)	CARBON DIOXIDE (CO2) (MG/L)	ALKA- LINITY AS CACO3 (MG/L)
OCT 21...	0930	7.0	--	--	48	5	1240	10.1	--	8.4	3.1	400
NOV 15...	1245	6.1	--	0	48	3	1240	9.9	--	8.4	3.1	390
DEC 07...	1300	2.5	--	1	48	4	1200	10.5	18	8.4	3.1	400
JAN 17...	1000	3.0	--	1	48	5	1200	9.8	--	8.3	3.9	400
FEB 21...	1400	6.0	--	1	48	4	1050	10.8	--	8.4	3.1	390
MAR 29...	0930	7.0	--	0	48	5	1200	9.8	8	8.1	6.4	410
APR 18...	0830	1.5	--	0	48	3	1225	9.6	--	8.3	4.0	410
JUN 14...	0945	12.0	--	1	48	4	1350	7.4	15	8.0	8.3	430
JUL 25...	1230	21.5	80020	1	48	6	1300	7.4	--	8.3	3.6	370
AUG 16...	0900	7.5	80020	1	48	5	1300	9.4	--	8.1	6.5	420

\* 0 = Cloudless  
1 = Partly Cloudy



UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306058 - WILLOW CREEK NEAR RIO BLANCO, CO.

PROCESS DATE 10/03/78  
DISTRICT CODE 08

WATER QUALITY DATA. WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	TOTAL FILT- RAHLE RESIDUE (MG/L)	TOTAL NON- FILT- RAHLE RESIDUE (MG/L)	OIL AND GREASE (MG/L)	DIS- SOLVED ORGANIC NITRO- GEN (N) (MG/L)	DIS- SOLVED AMMONIA NITRO- GEN (N) (MG/L)	DIS- SOLVED NITRITE (N) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED KJEL- DAHL NITRO- GEN (N) (MG/L)	DIS- SOLVED KJEL- DAHL NITRO- GEN (N) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)
OCT 21...	480	1	--	--	--	.03	.01	.00	.00	.04	.14	.00
NOV 15...	480	0	--	--	--	.11	.01	--	--	.12	--	.17
DEC 07...	480	1	880	100	0	.11	.01	--	--	.12	--	.23
JAN 17...	490	0	--	--	--	.68	.01	--	--	.69	--	.47
FEB 21...	480	0	--	--	--	.20	.07	--	--	.27	--	.36
MAR 29...	500	0	960	133	0	.27	.01	--	--	.28	--	.41
APR 18...	500	0	--	--	--	.32	.03	--	--	.35	--	.34
JUN 14...	520	0	1000	<1	0	.33	.00	--	--	.33	--	.14
JUL 25...	450	0	--	--	--	.30	.01	--	--	.31	--	.04
AUG 16...	510	0	--	--	--	.66	.02	--	--	.68	--	.01

PROCESS DATE 10/03/78  
DISTRICT CODE 08

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306058 - WILLOW CREEK NEAR RIO BLANCO, CO.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	PHOS- PHATE (P04) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHATE (P04) (MG/L)	TOTAL PHOS- PHATE (P) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHATE (P) (MG/L)	SUS- PENDED ORGANIC CARBON (C) (MG/L)	CYANIDE (CN) (MG/L)	TOTAL SUL- FIDE (S) (MG/L)	DIS- SOL- VED SUL- FIDE (S) (MG/L)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)
OCT 21...	.00	.00	.00	.00	2.5	.5	--	--	540	140	90
NOV 15...	.12	.00	.04	.00	7.4	1.0	--	--	530	140	87
DEC 07...	.21	.06	.07	.02	2.5	.8	--	.1	550	150	92
JAN 17...	.06	.00	.02	.00	2.0	.7	--	--	560	160	95
FEB 21...	.28	.03	.09	.01	3.7	2.0	--	--	520	120	92
MAR 29...	.21	.00	.07	.00	2.8	.7	.2	--	610	200	110
APR 18...	.12	.06	.04	.02	4.1	1.7	--	--	570	160	99
JUN 14...	.00	.00	.00	.00	7.2	1.4	.2	--	570	140	93
JUL 25...	.06	.03	.02	.01	6.8	.6	--	--	540	170	89
AUG 16...	.03	.00	.01	.00	9.3	--	--	--	550	130	90

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	SODIUM AD- SORP- TION RATIO	PERCENT SODIUM	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SI02) (MG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED BORON (B) (UG/L)
OCT 21...	76	2.3	33	1.5	9.8	340	.4	15	2	--	110
NOV 15...	76	2.1	31	1.6	9.8	320	.4	15	3	--	110
DEC 07...	76	2.1	31	1.4	9.7	330	.4	16	2	600	110
JAN 17...	78	2.0	30	1.5	9.9	330	.6	16	1	--	100
FEB 21...	70	2.1	32	1.9	9.5	320	.4	16	2	--	100
MAR 29...	80	2.1	30	1.5	18	330	.4	14	1	200	130
APR 18...	78	2.2	31	1.8	10	350	.4	14	1	--	110
JUN 14...	81	2.4	33	2.2	11	350	.4	15	1	200	120
JUL 25...	77	2.4	34	2.2	11	330	.4	17	3	--	120
AUG 16...	78	2.4	34	2.3	13	350	.4	16	1	--	120



UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306058 - WILLOW CREEK NEAR RIO BLANCO, CO.

PROCESS DATE 10/03/78  
DISTRICT CODE 08

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MANGANESE (MN) (UG/L)	DIS- SOLVED MOLYB- DENUM (MO) (UG/L)	DIS- SOLVED STRON- TIUM (SR) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	DIS- SOLVED LITHIUM (LI) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)
OCT 21...	--	--	--	30	--	20	--	--	--	--	--	--
NOV 15...	--	--	--	30	--	20	--	--	--	--	--	--
DEC 07...	1	0	1	30	1	20	3	3000	20	100	8	1
JAN 17...	--	--	--	20	--	30	--	--	--	--	--	--
FEB 21...	--	--	--	190	--	10	--	--	--	--	--	--
MAR 29...	0	0	0	30	0	20	4	2800	20	20	10	1
APR 18...	--	--	--	30	--	20	--	--	--	--	--	--
JUN 14...	3	5	3	120	5	10	4	3200	20	0	10	2
JUL 25...	--	--	--	90	--	0	--	--	--	--	--	--
AUG 16...	--	--	--	20	--	4	--	--	--	--	--	--

PROCESS DATE 10/03/78  
DISTRICT CODE 08

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306058 - WILLOW CREEK NEAR RIO BLANCO, CO.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	ATMOS- PHERIC ODOR (SEVER- ITY)	DIS- SOLVED GROSS BETA AS CS-137 (PC/L)	SUS- PENDED GROSS BETA AS CS-137 (PC/L)	DIS- SOLVED RA-226 (RADON METHOD) (PC/L)	DIS- SOLVED NATURAL URANIUM (U) (UG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM .7UM-MF (COL./ 100 ML)	STREP- TOCOCCHI (COL- ONIES PER 100 ML)	PHENOLS (UG/L)	METHY- LENE- BLUE ACTIVE SUB- STANCE (MG/L)	ALORIN IN BOTTOM MA- TERIAL (UG/KG)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)
OCT 21...	0	--	--	--	--	--	--	--	--	--	--	--
NOV 15...	0	--	--	--	--	--	--	--	--	--	--	--
DEC 07...	0	<2.4	3.8	.04	1.7	K16	K5	K20	1	--	--	--
JAN 17...	0	--	--	--	--	--	--	--	--	--	--	--
FEB 21...	0	--	--	--	--	--	--	--	--	--	--	--
MAR 29...	0	3.1	4.7	.06	2.5	--	--	--	0	.00	.0	.0
APR 18...	0	--	--	--	--	--	--	--	--	--	--	--
JUN 14...	0	<2.8	<.4	.13	2.5	44	35	--	1	--	--	--
JUL 25...	0	--	--	--	--	--	--	--	--	--	--	--
AUG 16...	0	--	--	--	--	--	--	--	--	--	--	--

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306058 - WILLOW CREEK NEAR RIO BLANCO, CO.

PROCESS DATE 10/03/78  
DISTRICT CODE 08

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	DDD IN BOTTOM MA- TERIAL (UG/KG)	DDE IN BOTTOM MA- TERIAL (UG/KG)	DDT IN BOTTOM MA- TERIAL (UG/KG)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	ETHION IN BOTTOM MA- TERIAL (UG/KG)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)	PCB IN BOTTOM MA- TERIAL (UG/KG)	MALA- THION IN BOTTOM MA- TERIAL (UG/KG)
OCT 21...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 15...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 07...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 17...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 21...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 29...	0	.0	.1	.0	.0	.0	.0	0	.0	.0	0	.0
APR 18...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 14...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 25...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 16...	--	--	--	--	--	--	--	--	--	--	--	--



UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
0930605H - WILLOW CREEK NEAR RIO BLANCO, CO.

PROCESS DATE 10/03/78  
DISTRICT CODE 08

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	PARA- THION IN BOTTOM MA- TERIAL (UG/KG)	DI- AZINON IN BOTTOM MA- TERIAL (UG/KG)	METHYL PARA- THION IN BOT- TOM MA- TERIAL (UG/KG)	2-4-D IN BOTTOM MA- TERIAL (UG/KG)	2,4,5-T IN BOTTOM MA- TERIAL (UG/KG)	SILVEX IN BOTTOM MA- TERIAL (UG/KG)	TRI- THION IN BOTTOM MA- TERIAL (UG/KG)	METHYL TRI- THION IN BOT- TOM MA- TERIAL (UG/KG)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L)	DIS- SOLVED SOLIDS (TONS PER AC-FT)	DIS- SOLVED AMMONIA (NH4) (MG/L)	DIS- SOLVED NITRATE (NO3) (MG/L)
OCT 21...	--	--	--	--	--	--	--	--	891	1.21	.01	.00
NOV 15...	--	--	--	--	--	--	--	--	857	1.17	.01	--
DEC 07...	--	--	--	--	--	--	--	--	878	1.19	.01	--
JAN 17...	--	--	--	--	--	--	--	--	885	1.20	.01	--
FEB 21...	--	--	--	--	--	--	--	--	858	1.17	.09	--
MAR 29...	.0	.0	.0	0	0	0	.0	.0	926	1.26	.01	--
APR 18...	--	--	--	--	--	--	--	--	921	1.25	.04	--
JUN 14...	--	--	--	--	--	--	--	--	944	1.28	.00	--
JUL 25...	--	--	--	--	--	--	--	--	879	1.20	.01	--
AUG 16...	--	--	--	--	--	--	--	--	931	1.27	.03	--

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306058 - WILLOW CREEK NEAR RIO BLANCO, CO.

WATER QUALITY DATA. WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED NITRITE (NO2) (MG/L)	BROMIDE (BR) (MG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE MSL)	DIS- SOLVED GROSS ALPHA AS U-NAT. (UG/L)	SUS- PENED GROSS ALPHA AS U-NAT. (UG/L)	DIS- SOLVED GROSS HEIA AS SR90 /Y90 (PC/L)	SUS- PENED GROSS BETA AS SR90 /Y90 (PC/L)
OCT 21...	.00	--	.0	6273.00	--	--	--	--
NOV 15...	--	--	--	6273.00	--	--	--	--
DEC 07...	--	.1	.0	6273.00	<9.4	6.6	<2.1	3.4
JAN 17...	--	--	--	6273.00	--	--	--	--
FEB 21...	--	--	--	6273.00	--	--	--	--
MAR 29...	--	.1	.0	6273.00	<9.8	5.8	2.7	4.0
APR 16...	--	--	--	6273.00	--	--	--	--
JUN 14...	--	.3	.1	6273.00	<9.9	<.4	<2.5	<.4
JUL 29...	--	--	--	6273.00	--	--	--	--
AUG 16...	--	--	--	6273.00	--	--	--	--

USGS WATER GAUGING STATION 09306061  
Piceance Creek Above Hunter Creek

A. DAILY TABLES

1. Gauge Height
2. Dissolved Oxygen
3. pH
4. Specific Conductance
5. Temperature

B. WATER QUALITY DATA  
PROCESS DATE 10/3/78



July 1907

Daily Range

At Rio Blanco, Colo.

for the Year Ending September 30, 1907.

Continued

Drainage Area 309 Square Miles.

Water-Stage Recorder

Ratio 1:1

Gage Read to

Once a Day by

Water Resources Division

Geological Survey

Department of the Interior

United States

Washington

File Number

09306061

1907

Used rating table dated No. 2

Gage heights used to half tenths between hundredths below and tenths above these limits.

and

feet

Discharge

Area

Drainage Area

309

Drainage Area

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Drainage Area

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Drainage Area

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Drainage Area

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Drainage Area

309

5. DISCHARGE SUBDIVIDED V - VARIABLE SHIFTS DISCHARGE ESTIMATED FOR

NO GAGE HEIGHT RECORD. C - LGE EFFECT.

1907

Calendar Year

1907

Max. Disch.

Min. Disch.

Area

Drainage Area

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Drainage Area

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Drainage Area

Max. Disch.

Min. Disch.

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Max. Disch.

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Max. Disch.

Min. Disch.

Area

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## Coding Form for Input and Up( of Daily Values--Continued

Station identification number

07305061

Water year

1278

2

may

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	12.2	12.0	9.3	8.2	10.2	10.2	1		9.5	9.7	7.8	8.9	12.0	1
2	11.4	12.2	9.1	8.1	10.9	9.8	2		9.1	10.2	7.9	8.9	12.1	2
3	12.4	12.0	8.9	9.8	10.9	10.4	3		8.8	10.7	7.9	8.7	12.0	3
4	11.2	11.9	9.2	9.1	11.0	10.7	4		9.1	11.4	7.8	9.2	12.1	4
5	11.6	12.4	9.4	9.2	10.9	9.8	5	10.2	9.2	11.6	7.7	8.1	12.3	5
6	12.1	11.5	9.3	8.0	10.2	9.8	6	9.7	9.4	Poor Fl	7.5	8.9	11.7	6
7	12.2	12.2	9.6	9.4	10.1	9.5	7	Poor Fl	9.2		7.1	9.5	12.0	7
8	12.4	10.5	9.7	8.2	10.1	10.4	8		9.1		7.1	9.6	11.2	8
9	12.1	11.5	9.8	8.2	10.1	10.2	9		10.0		6.9	9.9	9.2	9
10	11.7	11.5	9.9	8.0	10.2	Poor	10		9.5		6.7	10.0	9.5	10
11	12.2	11.2	9.1	8.2	9.9	Flow	11		9.3		6.5	10.2	11.1	11
12	12.0		9.0	8.3	10.5		12		9.4		6.6	11.0	9.9	12
13	12.2	11.9	9.1	8.4	10.9		13		9.7	8.4	7.0	10.9	9.4	13
14	12.4	12.2	9.0	8.2	10.7		14		9.2	8.1	7.0	10.9	8.1	14
15	12.2	12.0	9.1	8.2	10.9		15		9.2	8.8	7.0	11.6	9.9	15
16	11.9	10.5	8.8		10.8		16		9.1	9.6	7.1	11.6	8.3	16
17	12.2	10.4	9.0		10.8		17	10.1	9.4	10.1	7.3	11.7	7.6	17
18	12.2	12.2	9.1		10.9	11.0	18	11.5	9.7	10.4	6.7	12.0	10.1	18
19	11.7	12.0	9.2		11.1	10.6	19	12.9	9.3	10.3	6.6	12.1	10.3	19
20	12.2	12.2	9.1		11.8	10.6	20	12.9	9.4	10.6	7.3	12.2	10.6	20
21	12.2	12.2	9.0		11.0	10.9	21	10.2	9.7	10.0	8.6	12.1	10.4	21
22	12.1	12.9	9.1		11.0	10.1	22	11.0	8.9	10.4	7.7	11.5	10.3	22
23	12.2	12.2	9.2		10.9	10.8	23	11.2	8.6		7.1	11.7	10.2	23
24	12.2	12.0	9.5		10.6	10.9	24	11.9	8.6	8.8	7.2	11.6	10.1	24
25	12.2	12.1	9.6		10.8	10.9	25	11.1	8.9	8.8	9.2	11.8	10.3	25
26	12.3	12.3	9.7		9.8	10.7	26	11.2	9.1	8.4	8.9	12.9	10.2	26
27	12.0	12.0	9.2		9.9	10.6	27	11.4	9.2	7.8	8.9	12.9	9.5	27
28	12.1	12.3	9.4		10.4	10.4	28	11.4	9.5	8.2	8.9	13.0	9.4	28
29	12.1	12.4	9.3		10.4	10.2	29	11.4	9.6	7.6	8.9	12.8	9.3	29
30	12.2	12.2	9.6		10.5	10.9	30	11.1	9.5	8.2	8.8	12.4	9.8	30
31	11.2	11.2	9.6	10.9	10.9	Poor Fl	31	11.1	9.9	8.2	9.0	12.8	-----	31

## PI, CHECK CARD

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W-4

1871

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Preliminary Record  
Subject to Revision

Remarks



Station id

Location number

09306001

Piceance Cr. at Hunter Cr.

Water year

1979

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEP (09)	DAY
1	10.1						1							1
2	10.0						2							2
3	16.4						3							3
4	10.2						4							4
5	10.3						5							5
6	10.1						6							6
7	10.0						7							7
8	9.7						8							8
9	9.2						9							9
10	8.9						10							10
11	9.1						11							11
12	8.8						12							12
13	8.6						13							13
14	8.3						14							14
15	8.1						15							15
16	8.6						16							16
17	8.6						17							17
18	9.2						18							18
19	9.6						19							19
20	7.1						20							20
21	6.7						21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Type

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Water year

1979

Par Code

00300

Mat Code

00001

Preliminary Record

Subject to Revision

Remarks

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GPO : 1971 O - 442-477

# Coding Form for Input and Update of Daily Values--Continued

Station identification number

07306061

1978

Water year

1978

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DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	7.4	7.5	7.5	7.5	7.4	7.0	1		7.4	7.7	5.1	6.9	5.6	1
2	7.1	7.7	7.1	7.4	7.5	7.3	2		7.1	7.8	4.5	6.3	5.6	2
3	7.9	7.7	7.1	7.6	7.0	7.8	3		7.7	7.1	5.2	6.0	5.2	3
4	7.6	7.5	7.0	7.0	7.7	7.2	4		7.3	7.9	5.1	6.2	5.2	4
5	7.7	7.4	7.1	7.6	7.9	7.7	5	7.0	7.9	8.1	5.0	6.7	5.1	5
6	7.5	7.2	7.3	7.3	7.0	7.7	6	8.3	7.7	Rec Fl	5.1	6.9	5.1	6
7	7.4	7.0	7.5	7.6	7.7	8.1	7	8	7.3		7.9	7.2	5.1	7
8	7.6	7.1	7.5	7.6	7.2	7.3	8		7.3		7.7	6.9	5.2	8
9	7.6	7.2	7.5	7.5	7.9	7.2	9		7.5		7.9	7.0	4.3	9
10	7.7	7.4	7.4	7.4	7.3	7.7	10		7.6		5.0	6.7	3.1	10
11	7.0	7.7	7.4	7.4	7.5		11		7.3		5.0	6.9	6.6	11
12	7.8	7.3	7.5	7.6	10.0		12		7.6		4.8	6.5	5.9	12
13	7.5	7.0	7.6	7.5	9.5		13		7.4	5.8	4.6	6.6	5.0	13
14	7.9	7.1	7.3	7.5	9.6		14		7.2	5.5	4.5	6.8	4.6	14
15	7.7	7.9	7.0	7.2	9.9		15		7.2	5.3	5.1	6.6	4.6	15
16	7.6	7.2	7.0	7.3	10.0		16		7.2	5.2	4.7	6.3	4.4	16
17	7.5	7.5	7.5	7.5	10.4		17	10.1	7.4	5.3	5.0	6.4	4.2	17
18	7.7	7.9	7.7	7.5	10.3	7.5	18	10.0	7.1	4.9	5.1	6.3	4.5	18
19	7.7	7.6	7.8	7.5	9.8	7.1	19	7.4	7.5	5.0	5.1	5.9	6.7	19
20	7.7	7.9	7.5	7.4	9.9	7.3	20	7.1	7.4	4.9	6.2	5.7	6.7	20
21	7.7	7.9	7.7	7.2	9.8	7.1	21	7.3	7.0	4.9	7.1	5.6	6.3	21
22	7.7	7.7	7.5	7.4	9.4	7.3	22	7.6	7.2	4.9	6.9	5.6	6.0	22
23	7.5	7.7	7.6	7.4	9.2	7.1	23	8.1	7.2	4.9	6.8	5.2	4.3	23
24	7.5	7.0	7.4	7.0	8.9	7.3	24	7.0	7.3	4.6	7.3	5.1	5.7	24
25	7.9	7.9	7.7	7.2	8.7	7.4	25	7.5	7.7	4.8	6.5	5.3	5.7	25
26	7.6	7.6	7.4	7.5	8.1	7.1	26	7.6	7.6	4.8	6.5	5.7	5.9	26
27	7.7	7.7	7.0	7.9	7.7	7.9	27	7.6	8.0	5.1	6.5	5.9	5.9	27
28	7.6	7.8	7.8	7.0	7.7	7.9	28	7.3	7.8	5.3	6.9	5.7	4.3	28
29	7.7	8.0	7.5	7.6	7.0	7.0	29	7.5	7.6	5.6	6.9	5.8	5.5	29
30	7.7	7.0	7.2	7.3	7.3	7.5	30	7.8	7.9	5.1	6.4	5.7	5.6	30
31	7.3	7.4	7.4	7.7	7.7	7.1	31	7.0	8.0	6.9	6.9	5.6	5.6	31

TOTAL CHECK CARD

Type

Water year

Total value (sum of daily value entries)

Per Code

Preliminary Record  
Subject to Revision

Remarks



09306061 Piceance Cr. of Hunter Cr.

Station identification number

Water year

1979

D.O.

Card No. 01		DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
		1	5.4						1							1
		2	5.7						2							2
		3	5.6						3							3
		4	5.4						4							4
		5	5.3						5							5
		6	5.1						6							6
		7	5.0						7							7
		8	4.8						8							8
		9	4.8						9							9
		10	4.8						10							10
		11	4.8						11							11
		12	2.5						12							12
		13	5.0						13							13
		14	5.0						14							14
		15	5.1						15							15
		16	5.1						16							16
		17	4.9						17							17
		18	4.9						18							18
		19	4.9						19							19
		20	4.8						20							20
		21	4.8						21							21
		22							22							22
		23							23							23
		24							24							24
		25							25							25
		26							26							26
		27							27							27
		28							28							28
		29							29							29
		30							30							30
		31							31							31

TOTAL CHECK CARD

Type

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Water year

1979

Total value (sum of daily value entries)

21

Tax Code 00000

Stat Code 00000

Remarks



Station Identification number 09306061

1978

Water year

D.O. MEF, D

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	8.4	8.1	8.4	8.0	8.0	9.4	1		8.4	8.8	6.4	7.7	8.1	1
2	8.4	8.1	8.4	8.0	8.0	9.4	2		8.2	9.1	6.2	7.6	8.2	2
3	8.4	8.1	8.4	8.0	8.0	10.2	3		8.2	9.3	6.5	7.4	7.9	3
4	8.4	8.1	8.4	8.0	8.0	10.0	4		8.3	9.5	6.5	7.1	7.9	4
5	8.4	8.1	8.4	8.0	8.0	9.3	5		7.5	7.1	6.4	7.2	7.9	5
6	8.4	8.1	8.4	8.0	8.0	9.3	6	9.0	7.1	Per FI	6.2	7.9	7.7	6
7	8.4	8.1	8.4	8.0	8.0	9.1	7	PF	8.8		6.2	8.3	7.4	7
8	8.4	8.1	8.4	8.0	8.0	9.3	8		9.0		6.0	8.3	7.5	8
9	8.4	8.1	8.4	8.0	8.0	9.3	9		8.8		6.0	8.4	6.5	9
10	8.4	8.1	8.4	8.0	8.0	PF	10		8.6		5.8	8.2	5.9	10
11	8.4	8.1	8.4	8.0	8.0		11		8.8		5.8	8.2	9.1	11
12	8.4	8.1	8.4	8.0	8.0		12		8.7	8.0	5.7	8.1	7.3	12
13	8.4	8.1	8.4	8.0	8.0		13		8.2	7.1	5.9	8.4	6.9	13
14	8.4	8.1	8.4	8.0	8.0		14		8.2	7.8	5.8	8.4	6.0	14
15	8.4	8.1	8.4	8.0	8.0		15		8.2	7.8	6.0	9.2	6.1	15
16	8.4	8.1	8.4	8.0	8.0		16		8.2	8.1	6.0	8.7	6.0	16
17	8.4	8.1	8.4	8.0	8.0		17	10.4	8.9	8.3	5.4	8.6	5.6	17
18	8.4	8.1	8.4	8.0	8.0	9.4	18	10.3	9.4	8.3	5.7	8.6	6.7	18
19	8.4	8.1	8.4	8.0	8.0	9.4	19	9.8	8.7	8.1	5.8	8.7	8.0	19
20	8.4	8.1	8.4	8.0	8.0	9.4	20	9.2	8.4	8.3	6.9	8.4	8.1	20
21	8.4	8.1	8.4	8.0	8.0	9.4	21	9.5	8.3	8.0	7.7	8.3	8.0	21
22	8.4	8.1	8.4	8.0	8.0	9.4	22	9.3	8.0	7.6	8.0	7.7	7.9	22
23	8.4	8.1	8.4	8.0	8.0	9.4	23	---	7.9	6.8	7.9	7.9	7.4	23
24	8.4	8.1	8.4	8.0	8.0	9.4	24	8.4	8.1	6.7	8.1	7.8	7.5	24
25	8.4	8.1	8.4	8.0	8.0	9.4	25	8.4	8.2	6.7	7.7	7.7	7.4	25
26	8.4	8.1	8.4	8.0	8.0	9.4	26	7.8	8.2	6.8	7.7	8.3	7.5	26
27	8.4	8.1	8.4	8.0	8.0	9.4	27	9.2	8.5	6.4	7.7	8.5	7.4	27
28	8.4	8.1	8.4	8.0	8.0	9.4	28	---	8.7	6.8	7.8	8.6	7.2	28
29	8.4	8.1	8.4	8.0	8.0	9.4	29	8.1	8.5	6.6	7.7	8.4	7.1	29
30	8.4	8.1	8.4	8.0	8.0	9.4	30	8.5	8.6	6.8	7.7	8.2	7.3	30
31	8.4	8.1	8.4	8.0	8.0	9.4	31	---	8.8	---	7.8	8.3	---	31

TOTAL CHECK CARD

Type ☒ T ☐ S  
 Water year 17 20

Total value (sum of daily value entries)  
 21 32

Page 5020 00300  
 Stat Code 00000

Preliminary Record  
 Subject to Revision

Remarks

Coding Form for Input and Update of Daily Values--Continued

Station identification number 03306061 Piceance Cr. at Hunter Cr. Water year 1979 D.O. ME

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	7.2						1							1
2	7.3						2							2
3	7.4						3							3
4	7.3						4							4
5	7.1						5							5
6	7.0						6							6
7	6.7						7							7
8	6.5						8							8
9	6.3						9							9
10	6.1						10							10
11	6.2						11							11
12	5.9						12							12
13	6.2						13							13
14	6.2						14							14
15	6.2						15							15
16	6.3						16							16
17	6.1						17							17
18	5.9						18							18
19	5.9						19							19
20	5.5						20							20
21	5.3						21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type T

Water year 1979

Total value (sum of daily value entries)

00300  
Water Code 00003

Preliminary Record  
Subject to Revision

Remarks



Station identification number

09306061

Percentage of the population aged 15 and over who are literate

1978

$$F \# \max$$

TOTAL CHECK CARD

Type T 1

Water year	17	2
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Total value (sum of daily value entries)	21	32
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Lat 0050.

Preliminary Record  
Subject to Revision  
Subject to *Official*

Remarks



Coding Form for Input and te of Daily Values--Continued

Station identification number 09306061 Piceance Cr. at Hunter Cr.

Water year 1979

PH 10/11/79

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	9.3						1							1
2	9.3						2							2
3	9.3						3							3
4	9.3						4							4
5	9.3						5							5
6	9.3						6							6
7	9.3						7							7
8	9.3						8							8
9	9.1						9							9
10	9.1						10							10
11	9.1						11							11
12	9.1						12							12
13	9.1						13							13
14	9.1						14							14
15	9.1						15							15
16	9.1						16							16
17	9.1						17							17
18	9.1						18							18
19	9.1						19							19
20	9.1						20							20
21	9.0						21							21
22	9.0						22							22
23	9.1						23							23
24	9.1						24							24
25	9.1						25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

Total value (sum of daily value entries)

21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
----	----	----	----	----	----	----	----	----	----	----	----	---	---	---	---	---	---	---	---	---

Type T Water year 1979

TOTAL CHECK CARD

Preliminary Record  
Subject to Revision

Bar Code 00400  
Data Code 00001

Remarks

$$\frac{2}{m} \pm A$$

Coding Form for Incident and U... e of Daily Values--Continued

Station Identification number

1978

1

$$\frac{2}{m} \pm A$$

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	8.2	8.1	8.2	8.3	8.4	8.2	1		8.0	8.4	8.4	8.1	8.0	1
2	8.1	8.1	8.4	8.3	8.4	8.2	2		7.9	8.4	8.4	8.1	8.0	2
3	8.2	8.1	8.4	8.4	8.4	8.2	3		7.9	8.4	8.4	8.1	8.0	3
4	8.1	8.1	8.4	8.4	8.3	8.2	4		8.0	8.4	8.3	8.2	8.0	4
5	8.0	8.0	8.4	8.4	8.4	8.2	5	8.1	8.0	8.4	8.2	8.3	8.1	5
6	8.0	8.3	8.4	8.4	8.3	8.2	6	8.2	7.9	P.F.	8.3	8.2	8.0	6
7	8.0	7.9	8.4	8.4	8.3	8.1	7	P.F.	8.0		8.2	8.2	8.0	7
8	8.1	8.0	8.4	8.3	8.3	8.1	8		8.3		8.2	8.2	8.0	8
9	8.0	8.1	8.3	8.4	8.4	8.2	9		8.4		8.2	8.2	8.0	9
10	8.1	8.1	8.4	8.4	8.3	P.F.	10		8.6		8.2	8.2	8.0	10
11	8.1	8.1	8.4	8.4	8.3		11		8.5		8.2	8.2	8.2	11
12	8.1	8.1	8.4	8.4	8.4		12		8.5		8.2	8.1	8.0	12
13	8.1	8.1	8.4	8.4	8.3		13		8.4	8.4	8.2	8.1	8.1	13
14	8.1	8.1	8.4	8.4	8.3		14		8.4	8.4	8.2	8.4	8.1	14
15	8.1	8.1	8.4	8.4	8.3		15		8.5	8.4	8.2	8.1	8.0	15
16	8.0	8.1	8.4	8.4	8.3		16		8.5	8.3	8.2	8.1	8.1	16
17	8.0	8.1	8.3	8.4	8.3		17	8.2	8.5	8.2	8.2	8.1	8.1	17
18	8.1	8.0	8.4	8.4	8.3	8.2	18	8.3	8.5	8.2	8.2	8.1	8.1	18
19	8.1	8.0	8.3	8.4	8.4	8.2	19	8.3	8.4	8.3	8.2	8.0	8.1	19
20	8.1	8.1	8.3	8.4	8.3	8.2	20	8.3	8.4	8.3	8.2	8.1	8.1	20
21	8.0	8.2	8.2	8.4	8.3	8.2	21	8.3	8.4	8.3	8.2	8.1	8.1	21
22	8.0	8.2	8.3	8.4	8.2	8.3	22	8.4	8.4	8.4	8.1	8.0	8.1	22
23	8.1	8.2	8.4	8.4	8.2	8.2	23	8.4	8.4	8.4	8.1	8.0	8.1	23
24	8.1	8.3	8.4	8.4	8.2	8.2	24	8.1	8.4	8.4	8.1	8.0	8.1	24
25	8.1	8.3	8.4	8.4	8.2	8.2	25	8.1	8.4	8.4	8.1	8.0	8.1	25
26	8.0	8.2	8.4	8.4	8.2	8.2	26	8.0	8.4	8.4	8.0	8.0	8.3	26
27	8.0	8.2	8.4	8.4	8.2	8.2	27	8.0	8.4	8.4	8.0	8.0	8.4	27
28	8.0	8.2	8.4	8.4	8.2	8.1	28	8.0	8.4	8.4	8.2	8.0	8.9	28
29	8.0	8.2	8.4	8.4	8.2	8.1	29	8.0	8.4	8.3	8.1	8.0	8.2	29
30	8.0	8.2	8.4	8.4	8.2	8.1	30	8.0	8.3	8.3	8.1	8.0	8.2	30
31	8.0	8.2	8.4	8.4	8.2	P.F.	31	8.0	8.4	8.3	8.2	8.0	8.2	31

TOTAL CHECK CARD

Type

Water year

Total value (sum of daily value entries)

1	7	8	20
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[illegible]

Part Code 11400

Preliminary Record  
Subject to Revision

Remarks



# Coding Form for Input and Transfer of Daily Values--Continued

Station identification number 09306061 Piceance Cr. at Munier Cr. Water year 1979 PH min

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	8.1						1							1
2	8.1						2							2
3	5.1						3							3
4	8.1						4							4
5	8.1						5							5
6	5.0						6							6
7	8.0						7							7
8	8.0						8							8
9	8.0						9							9
10	7.9						10							10
11	7.9						11							11
12	8.0						12							12
13	8.0						13							13
14	8.0						14							14
15	8.0						15							15
16	8.0						16							16
17	8.0						17							17
18	7.9						18							18
19	8.0						19							19
20	8.0						20							20
21	7.9						21							21
22	7.9						22							22
23	7.9						23							23
24	8.0						24							24
25	8.1						25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type T Water year 1979 17 20

Total value (sum of daily value entries) 21 32

Raw Code 000000  
Raw Code 000000

Preliminary Record  
Subject to Revision

Remarks



09306061

Station identification number

Water year 1978

74 MEAN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	8.2	8.1	8.4	8.4	8.4	8.5	1		8.1	8.5	8.4	8.2	8.1	1
2	8.2	8.1	8.4	8.3	8.3	8.3	2		8.0	8.5	8.4	8.2	8.1	2
3	8.2	8.1	8.4	8.4	8.4	8.3	3		8.0	8.5	8.4	8.2	8.1	3
4	8.1	8.1	8.4	8.4	8.4	8.3	4		8.0	8.5	8.4	8.2	8.1	4
5	8.1	8.1	8.4	8.4	8.4	8.3	5	9.2	8.0	8.5	8.4	8.2	8.1	5
6	8.1	8.1	8.4	8.4	8.4	8.3	6	9.2	8.2	8.5	8.4	8.2	8.1	6
7	8.1	8.1	8.4	8.4	8.4	8.3	7	PF	8.2	8.5	8.4	8.2	8.1	7
8	8.1	8.1	8.4	8.4	8.4	8.3	8		8.2	8.5	8.4	8.2	8.1	8
9	8.1	8.1	8.4	8.4	8.4	8.3	9		8.2	8.5	8.4	8.2	8.1	9
10	8.1	8.1	8.4	8.4	8.4	8.3	10		8.2	8.5	8.4	8.2	8.1	10
11	8.1	8.1	8.4	8.4	8.4	8.3	11		8.2	8.5	8.4	8.2	8.1	11
12	8.1	8.1	8.4	8.4	8.4	8.3	12		8.2	8.5	8.4	8.2	8.1	12
13	8.1	8.1	8.4	8.4	8.4	8.3	13		8.2	8.5	8.4	8.2	8.1	13
14	8.1	8.1	8.4	8.4	8.4	8.3	14		8.2	8.5	8.4	8.2	8.1	14
15	8.1	8.1	8.4	8.4	8.4	8.3	15		8.2	8.5	8.4	8.2	8.1	15
16	8.1	8.1	8.4	8.4	8.4	8.3	16		8.2	8.5	8.4	8.2	8.1	16
17	8.1	8.1	8.4	8.4	8.4	8.3	17		8.2	8.5	8.4	8.2	8.1	17
18	8.1	8.1	8.4	8.4	8.4	8.3	18		8.2	8.5	8.4	8.2	8.1	18
19	8.1	8.1	8.4	8.4	8.4	8.3	19		8.2	8.5	8.4	8.2	8.1	19
20	8.1	8.1	8.4	8.4	8.4	8.3	20		8.2	8.5	8.4	8.2	8.1	20
21	8.1	8.1	8.4	8.4	8.4	8.3	21		8.2	8.5	8.4	8.2	8.1	21
22	8.1	8.1	8.4	8.4	8.4	8.3	22		8.2	8.5	8.4	8.2	8.1	22
23	8.1	8.1	8.4	8.4	8.4	8.3	23		8.2	8.5	8.4	8.2	8.1	23
24	8.1	8.1	8.4	8.4	8.4	8.3	24		8.2	8.5	8.4	8.2	8.1	24
25	8.1	8.1	8.4	8.4	8.4	8.3	25		8.2	8.5	8.4	8.2	8.1	25
26	8.1	8.1	8.4	8.4	8.4	8.3	26		8.2	8.5	8.4	8.2	8.1	26
27	8.1	8.1	8.4	8.4	8.4	8.3	27		8.2	8.5	8.4	8.2	8.1	27
28	8.1	8.1	8.4	8.4	8.4	8.3	28		8.2	8.5	8.4	8.2	8.1	28
29	8.1	8.1	8.4	8.4	8.4	8.3	29		8.2	8.5	8.4	8.2	8.1	29
30	8.1	8.1	8.4	8.4	8.4	8.3	30		8.2	8.5	8.4	8.2	8.1	30
31	8.1	8.1	8.4	8.4	8.4	8.3	31	-----	8.5	-----	8.2	8.1	-----	31

TOTAL CHECK CARD

Type ☐ T ☐ 1

Water year 1978

Total value (sum of daily value entries)

21 32

Par Code 000000

Stat Code 000000

Preliminary Results  
Subject to Revision

Remarks

# Coding Form for Input and Values of Daily Values--Continued

09306031 Piceance Cr. at Hunter Cr.

Water year 1977

Station identification number

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	8.2						1							1
2	8.2						2							2
3	8.2						3							3
4	8.1						4							4
5	8.1						5							5
6	8.1						6							6
7	8.1						7							7
8	8.0						8							8
9	8.0						9							9
10	8.0						10							10
11	8.0						11							11
12	8.1						12							12
13	8.0						13							13
14	8.0						14							14
15	8.0						15							15
16	8.0						16							16
17	8.0						17							17
18	8.0						18							18
19	8.0						19							19
20	8.0						20							20
21	8.0						21							21
22	8.0						22							22
23	8.0						23							23
24	8.0						24							24
25	8.1						25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Total value (sum of daily value entries)

Type T 1 17 20

21 32

Par Code 00400

Water Code 00000

Preliminary Record  
Subject to Revision

Remarks



# Coding Form for Input and U<sub>1</sub> e of Daily Values--Continued

Station Identification number

09306061

Revised 02-08-1971

Water year

1978

COND

MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	1444	1444	1444	1444	1444	1444	1		1105	1425	1380	1329	1452	1
2	1504	1444	1326	1444	1444	1444	2		1070	1416	1396	1329	1450	2
3	1444	1444	1344	1344	1344	1344	3		1052	1410	1389	1329	1454	3
4	1444	1444	1344	1302	1385	1150	4		1006	1434	1410	1323	1450	4
5	1444	1444	1344	1310	1384	1110	5	1144	996	1436	1409	1322	1445	5
6	1444	1444	1344	1310	1384	1110	6	7442	No DATA	PT	1401	1312	1416	6
7	1444	1444	1344	1328	1320	1110	7	POUR FL			1305	1310	1402	7
8	1444	1444	1344	1384	1329	1110	8		No DATA		1418	1308	1376	8
9	1444	1444	1344	1332	1344	1110	9		1179		1436	1302	1316	9
10	1444	1444	1344	1318	1326	1110	10		1169		1428	1270	1392	10
11	1444	1444	1344	1312	1322	1110	11		1130		1431	1300	1388	11
12	1444	1444	1344	1314	1326		12		1139		1425	1394	1384	12
13	1444	1444	1344	1318	1320		13		1144	1308	1423	1402	1384	13
14	1444	1444	1344	1348	1320		14		1159	1431	1439	1396	1384	14
15	1444	1444	1344	1310	1320		15		1141	1433	1424	1354	1376	15
16	1444	1444	1344	1310	1320		16		1137	1430	1421	1348	1354	16
17	1444	1444	1344	1312	1320		17	879	1136	1420	1425	1330	1350	17
18	1444	1444	1344	1310	1320		18	903	1138	1420	1360	1406	1362	18
19	1444	1444	1344	1314	1320		19	918	1217	1430	1341	1412	1402	19
20	1444	1444	1344	1310	1320		20	949	1225	1433	1325	1424	1402	20
21	1444	1444	1344	1310	1320		21	955	1237	1430	1320	1424	1404	21
22	1444	1444	1344	1310	1320		22	995	1243	1430	1324	1466	1394	22
23	1444	1444	1344	1310	1320		23	1050	1249	1435	1314	1396	1392	23
24	1444	1444	1344	1310	1320		24	1100	1297	1435	1324	1386	1404	24
25	1444	1444	1344	1310	1320		25	1103	1297	1437	1310	1380	1392	25
26	1444	1444	1344	1310	1320		26	1110	1311	1431	1330	1418	1364	26
27	1444	1444	1344	1310	1320		27	1134	1311	1437	1333	1432	1326	27
28	1444	1444	1344	1310	1320		28	1176	1298	1381	1337	1446	1318	28
29	1444	1444	1344	1310	1320		29	1168	1298	1396	1337	1430	1352	29
30	1444	1444	1344	1310	1320		30	1112	1331	1356	1331	1444	1406	30
31	1444	1444	1344	1310	1320		31	-----	1289	-----	1331	1446	-----	31

TOTAL CHECK CARD

Type

Water year

Total value (sum of daily value entries)

☐ T  
☐ 1  
☐ 17  
☐ 20

☐ 21  
☐ 32

Par Code 14-1995

Stat Code 14-1995

Preliminary Record  
Subject to Revision

Remarks



# Coding Form for Input and Update of Daily Values--Continued

DATA

CON MAY

Water year 1977

Station identification number 09306061 Piceance Cr. at Hunter Cr.

Station identification number

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	1412						1							1
2	1410						2							2
3	1410						3							3
4	1486						4							4
5	1484						5							5
6	1506						6							6
7	1526						7							7
8	1533						8							8
9	1526						9							9
10	1550						10							10
11	1522						11							11
12	1592						12							12
13	1584						13							13
14	1546						14							14
15	1541						15							15
16	1530						16							16
17	1528						17							17
18	1564						18							18
19	1512						19							19
20	1636						20							20
21	1516						21							21
22	1570						22							22
23	1572						23							23
24	1572						24							24
25	1540						25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type T 1  
Water year 1977

Total value (sum of daily value entries)  
21 32

Par Code 00095  
Stat Code 00001

Preliminary Record  
Subject to Revision

Remarks

# Coding Form for Input and Use of Daily Values--Continued

Station identification number

02000001

Water year

1978

COND

MIN

CARD NO.	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1	1400	1400	1314	1200	1110	1	111	992	1510	1335	1298	1410	1
	2	1404	1404	1344	1204	1090	2		1003	1509	1330	1290	1400	2
	3	1410	1410	1372	1202	1080	3		967	1408	1343	1268	1395	3
	4	1414	1414	1372	1202	1080	4		965	1408	1365	1275	1400	4
	5	1418	1418	1372	1202	1080	5		969	1411	1350	1275	1390	5
	6	1422	1422	1372	1202	1080	6		NO DATA	PF	1355	1292	1394	6
	7	1426	1426	1372	1202	1080	7		NO DATA		1371	1286	1366	7
Card No. 02	8	1430	1430	1372	1202	1080	8		NO DATA		1371	1288	1370	8
	9	1434	1434	1372	1202	1080	9		1149		1386	1278	1355	9
	10	1438	1438	1372	1202	1080	10		1117		1382	1244	1370	10
	11	1442	1442	1372	1202	1080	11		1110		1380	1262	1294	11
	12	1446	1446	1372	1202	1080	12		1090		1368	1280	1266	12
	13	1450	1450	1372	1202	1080	13		1111		1371	1329	1364	13
	14	1454	1454	1372	1202	1080	14		1134		1370	1310	1360	14
Card No. 03	15	1458	1458	1372	1202	1080	15		1108		1404	1332	1344	15
	16	1462	1462	1372	1202	1080	16		1091		1400	1330	1320	16
	17	1466	1466	1372	1202	1080	17		1090		1352	1312	1326	17
	18	1470	1470	1372	1202	1080	18		1095		1339	1310	1292	18
	19	1474	1474	1372	1202	1080	19		1170		1212	1376	1360	19
	20	1478	1478	1372	1202	1080	20		1189		1235	1386	1368	20
	21	1482	1482	1372	1202	1080	21		1194		1234	1386	1353	21
Card No. 04	22	1486	1486	1372	1202	1080	22		1216		1232	1372	1353	22
	23	1490	1490	1372	1202	1080	23		1225		1232	1372	1349	23
	24	1494	1494	1372	1202	1080	24		1236		1232	1368	1344	24
	25	1498	1498	1372	1202	1080	25		1230		1232	1368	1344	25
	26	1502	1502	1372	1202	1080	26		1234		1279	1330	1290	26
	27	1506	1506	1372	1202	1080	27		1273		1276	1404	1260	27
	28	1510	1510	1372	1202	1080	28		1270		1293	1396	1273	28
Card No. 05	29	1514	1514	1372	1202	1080	29		1260		1297	1404	1290	29
	30	1518	1518	1372	1202	1080	30		1294		1268	1404	1264	30
	31	1522	1522	1372	1202	1080	31		1331		1299	1404	1264	31

TOTAL CHECK CARD

Type

Water year

Total value (sum of daily value entries)

1

20

21

32

Par Code

Stat Code

Preliminary Record  
Subject to Revision

marks







## Coding Form for Input and Update of Daily Values--Continued

Section identification number

ter year 978

CORD

14512

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	1437	1438	1439	1440	1441	1442	1	1443	1444	1445	1446	1447	1448	1
2	1438	1439	1440	1441	1442	1443	2	1444	1445	1446	1447	1448	1449	2
3	1439	1440	1441	1442	1443	1444	3	1445	1446	1447	1448	1449	1450	3
4	1440	1441	1442	1443	1444	1445	4	1446	1447	1448	1449	1450	1451	4
5	1441	1442	1443	1444	1445	1446	5	1447	1448	1449	1450	1451	1452	5
6	1442	1443	1444	1445	1446	1447	6	1448	1449	1450	1451	1452	1453	6
7	1443	1444	1445	1446	1447	1448	7	1449	1450	1451	1452	1453	1454	7
8	1444	1445	1446	1447	1448	1449	8	1450	1451	1452	1453	1454	1455	8
9	1445	1446	1447	1448	1449	1450	9	1451	1452	1453	1454	1455	1456	9
10	1446	1447	1448	1449	1450	1451	10	1452	1453	1454	1455	1456	1457	10
11	1447	1448	1449	1450	1451	1452	11	1453	1454	1455	1456	1457	1458	11
12	1448	1449	1450	1451	1452	1453	12	1454	1455	1456	1457	1458	1459	12
13	1449	1450	1451	1452	1453	1454	13	1455	1456	1457	1458	1459	1460	13
14	1450	1451	1452	1453	1454	1455	14	1456	1457	1458	1459	1460	1461	14
15	1451	1452	1453	1454	1455	1456	15	1457	1458	1459	1460	1461	1462	15
16	1452	1453	1454	1455	1456	1457	16	1458	1459	1460	1461	1462	1463	16
17	1453	1454	1455	1456	1457	1458	17	1459	1460	1461	1462	1463	1464	17
18	1454	1455	1456	1457	1458	1459	18	1460	1461	1462	1463	1464	1465	18
19	1455	1456	1457	1458	1459	1460	19	1461	1462	1463	1464	1465	1466	19
20	1456	1457	1458	1459	1460	1461	20	1462	1463	1464	1465	1466	1467	20
21	1457	1458	1459	1460	1461	1462	21	1463	1464	1465	1466	1467	1468	21
22	1458	1459	1460	1461	1462	1463	22	1464	1465	1466	1467	1468	1469	22
23	1459	1460	1461	1462	1463	1464	23	1465	1466	1467	1468	1469	1470	23
24	1460	1461	1462	1463	1464	1465	24	1466	1467	1468	1469	1470	1471	24
25	1461	1462	1463	1464	1465	1466	25	1467	1468	1469	1470	1471	1472	25
26	1462	1463	1464	1465	1466	1467	26	1468	1469	1470	1471	1472	1473	26
27	1463	1464	1465	1466	1467	1468	27	1469	1470	1471	1472	1473	1474	27
28	1464	1465	1466	1467	1468	1469	28	1470	1471	1472	1473	1474	1475	28
29	1465	1466	1467	1468	1469	1470	29	1471	1472	1473	1474	1475	1476	29
30	1466	1467	1468	1469	1470	1471	30	1472	1473	1474	1475	1476	1477	30
31	1467	1468	1469	1470	1471	1472	31	1473	1474	1475	1476	1477	1478	31

TOTAL CHECK CARD

Type

Water year

Total value (sum of daily value entries)

[illegible]

Page 100

Stat Code 111

# Preliminary Record Subject to Revision

Remarks

COND Nissan

Preliminary Report  
Subject to Revision

C.F.C. : 1971 O - 442 - 477



# Coding Form for Input and Use of Daily Values--Continued

Station identification number 09306061 Flow at 20 miles up river from mouth of river Water year 1978 7 EMP MA

CARD NO.	DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1	14.0	9.6	3.2	0.9	1.1	1.1	1		14.0	13.6	21.7	20.2	19.7	1
	2	14.0	9.6	1.5	6.6	5.4	7.5	2		16.6	1.3	21.2	22.9	18.6	2
	3	14.1	10.2	5.0	1.3	1.6	3.7	3		13.1	16.0	20.7	22.5	20.4	3
	4	12.2	10.1	6.3	5.0	5.8	1.1	4		14.2	12.2	21.1	22.3	20.1	4
	5	17.2	11.0	4.8	5.2	4.9	5.4	5		9.5	15.3	21.5	18.1	21.6	5
	6	14.6	9.6	5.6	4.3	4.6	5.6	6		9.6	PF	20.3	22.1	20.8	6
	7	14.5	11.0	4.5	3.8	4.0	11.7	7	Flow	9.1		22.6	20.7	19.9	7
Card No. 02	8	14.7	9.7	3.8	2.3	6.5	11.1	8	Flow	11.6		22.7	22.7	19.2	8
	9	12.5	10.8	3.1	4.9	4.7	10.5	9		1.0		21.3	21.4	19.1	9
	10	14.2	9.9	5.7	5.2	1.5	Flow	10		15.4		21.9	20.0	17.8	10
	11	14.0	9.8	5.5	5.5	5.6	Flow	11		13.0		21.9	17.9	16.2	11
	12	14.7	9.1	5.0	11.4	5.0		12		16.5		23.5	20.9	16.8	12
	13	12.1	9.1	4.2	4.5	6.8		13		18.5	21.9	24.8	18.9	19.0	13
	14	12.1	9.1	4.1	4.0	6.6		14		14.2	20.1	25.9	14.7	13.8	14
Card No. 03	15	12.2	8.8	6.7	5.2	4.6		15		18.9	21.4	21.3	20.3	17.6	15
	16	12.3	7.9	4.0	2.1	5.5		16		18.3	21.0	20.6	20.7	13.2	16
	17	12.1	7.6	0.2	1.1	2.8		17		11.3	21.1	22.1	20.6	13.6	17
	18	12.3	2.3	3.2	3.4	2.2	12.8	18		13.2	22.1	20.4	19.8	13.7	18
	19	10.9	6.4	1.6	2.1	5.1	9.8	19		13.6	20.7	20.5	21.3	10.2	19
	20	11.2	2.7	1.5	1.1	5.2	13.0	20		19.1	22.6	22.5	20.7	13.2	20
	21	11.0	2.6	0.6	1.1	4.6	11.5	21		13.2	21.6	21.3	20.3	15.1	21
Card No. 04	22	12.5	6.9	0.8	1.1	4.0	4.2	22		13.2	22.6	22.2	17.8	13.2	22
	23	12.0	6.7	2.2	2.0	4.0	4.1	23		18.1	22.0	21.9	21.3	16.8	23
	24	11.0	5.5	1.5	2.0	4.7	4.1	24		17.7	22.2	20.8	21.6	14.9	24
	25	13.7	4.8	2.7	3.0	4.6	13.5	25		12.1	20.0	23.2	18.7	17.3	25
	26	12.4	4.6	3.6	3.3	9.0	14.4	26		18.0	20.7	23.6	21.7	17.2	26
	27	11.1	5.2	2.9	3.0	4.1	15.4	27		16.2	18.6	24.3	20.6	16.3	27
	28	11.1	6.2	5.5	3.5	4.1	15.1	28		17.4	18.2	20.9	21.0	16.7	28
	29	10.1	4.4	5.6	3.0	4.0	16.5	29		17.2	17.7	20.5	20.7	16.2	29
	30	10.4	5.2	4.1	3.9	4.0	12.5	30		18.2	19.3	23.8	19.2	15.3	30
	31	6.8	-----	3.8	1.1	-----	11.0 Flow	31	-----	18.1	-----	19.6	19.3	-----	31

TOTAL CHECK CARD

Type ☒ T Water year  17  20  21  22  23  24  25  26  27  28  29  30  31

Total value (sum of daily value entries)

21  22  23  24  25  26  27  28  29  30  31

Par Code 00000 Stat Code 00001

Preliminary Report  
Subject to Revision

Remarks



Coding Form for Input and e of Daily Values--Continued

Station identification number 09306061 Piceance Cr. at Hunter Cr.

Water year 1979

TEMP MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	16.1						1							1
2	14.8						2							2
3	14.5						3							3
4	15.4						4							4
5	15.3						5							5
6	15.2						6							6
7	15.1						7							7
8	13.8						8							8
9	14.9						9							9
10	14.7						10							10
11	15.0						11							11
12	15.0						12							12
13	13.1						13							13
14	13.8						14							14
15	13.3						15							15
16	12.9						16							16
17	11.7						17							17
18	13.0						18							18
19	13.9						19							19
20	10.6						20							20
21	11.0						21							21
22	11.5						22							22
23	13.9						23							23
24	15.1						24							24
25	14.3						25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type T

Water year 1979

Total value (sum of daily value entries)



Year Code 00010

Heat Code 00001

Preliminary Record  
Not to be used

Remarks

# Coding Form for Input and Update of Daily Values--Continued

Station identification number 0306061 Pineville CR 18.44444444 N 82.22222222 W Water year 1978 TEMP MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	2.5	2.5	0.2	0.2	1.4	1.0	1		5.6	6.4	10.5	12.2	10.0	1
2	2.5	2.0	2.5	0.2	0.3	2.7	2		6.2	6.6	10.2	11.3	9.7	2
3	9.2	4.1	5.1	0.3	0.3	0.1	3		4.3	9.3	9.8	12.0	9.9	3
4	11.4	4.7	4.4	1.5	0.2	0.1	4		5.1	8.9	8.7	11.4	10.2	4
5	10.1	5.6	1.7	2.3	6.3	4.1	5	5.6	5.1	8.4	8.5	10.7	10.3	5
6	5.7	4.0	0.4	3.0	3.9	3.6	6	5.3	4.6	PF	10.0	15.4	11.2	6
7	2.7	4.1	1.4	5.2	1.0	4.3	7	5.4	4.6		9.3	11.3	12.2	7
8	6.8	3.1	0.5	0.2	2.5	1.7	8				9.3	12.1	11.0	8
9	2.3	1.3	0.0	1.0	2.5	2.5	9		5.0		9.3	11.7	9.9	9
10	4.1	1.6	2.0	3.3	POOR	POOR	10		3.2		10.2	12.8	10.7	10
11	4.1	2.9	1.3	2.2	0.9	KNOW	11		6.1		11.1	12.3	13.4	11
12	4.1	4.2	3.0	2.0	0.6		12		3.2		10.6	12.5	8.3	12
13	4.7	3.1	0.6	0.6	0.5		13		3.2	8.0	8.7	12.3	6.8	13
14	5.2	2.5	2.6	0.5	2.1		14		6.8	8.3	9.0	10.5	7.4	14
15	5.7	2.5	1.1	3.3	0.2		15		4.5	7.8	9.7	7.9	9.1	15
16	5.9	3.2	0.2	3.7	0.9		16		8.1	7.4	10.6	9.4	9.8	16
17	2.4	2.8	0.1	3.5	0.2		17		6.7	7.3	11.7	9.5	11.3	17
18	5.1	5.6	0.0	2.0	2.3	1.4	18	1.5	8.4	7.2	12.1	9.3	9.0	18
19	5.0	0.6	0.2	0.1	0.2	3.7	19	3.4	5.2	8.4	13.3	9.4	7.1	19
20	6.2	0.2	0.2	2.0	1.3	3.1	20	4.2	6.7	7.4	11.3	9.1	6.8	20
21	7.1	0.2	0.1	0.2	2.9	3.5	21	4.4	9.5	8.3	12.2	10.6	4.8	21
22	7.1	1.8	0.3	0.2	0.2	5.4	22	1.3	7.4	6.6	10.6	12.5	6.1	22
23	5.1	5.7	0.3	0.4	0.3	4.6	23	3.7	8.5	4.6	10.9	16.4	7.3	23
24	5.2	1.9	0.9	0.2	1.2	3.2	24	4.0	7.3	11.1	10.9	9.8	7.8	24
25	5.1	4.3	0.2	1.1	2.1	2.6	25	3.1	7.3	12.5	12.0	10.7	8.4	25
26	5.1	4.4	0.5	1.1	3.9	3.9	26	2.9	6.6	8.4	11.1	9.8	8.6	26
27	5.2	2.0	0.6	1.1	4.0	4.4	27	6.6	7.9	9.6	11.5	8.5	5.6	27
28	5.5	0.2	0.5	1.1	1.6	4.6	28	6.1	7.4	13.7	12.8	8.6	3.8	28
29	6.0	1.1	0.2	1.1	---	5.5	29	5.8	7.1	10.5	15.1	8.9	9.0	29
30	6.1	1.5	2.4	---	-----	2.9	30	6.9	8.5	10.3	12.4	8.8	7.8	30
31	4.9	-----	0.3	---	-----	POOR	31	-----	8.0	-----	14.7	10.4	-----	31

101.1 CHECK CARD

Type ☒ T ☐ W Water year  1  7  8

Total value (sum of daily value entries)  21  32

Far Code 220200  
Stat Code 0002

Preliminary Record  
Subject to Revision

n-marks



Station id	cation number
1	1
2	2
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99	99
100	100

Water year

1970

Twip

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	7.2						1							1
2	7.6						2							2
3	5.0						3							3
4	5.6						4							4
5	1.7						5							5
6	6.6						6							6
7	7.3						7							7
8	7.3						8							8
9	9.0						9							9
10	9.2						10							10
11	3.1						11							11
12	7.6						12							12
13	6.8						13							13
14	6.4						14							14
15	6.9						15							15
16	7.1						16							16
17	7.6						17							17
18	3.6						18							18
19	7.1						19							19
20	7.5						20							20
21	7.5						21							21
22	9.9						22							22
23	11.9						23							23
24	12.3						24							24
25	12.6						25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type

Water: year

Type	Water year
T	1979
I	17 20

Total value (sum of daily value entries)

Total value (sum of daily value entries)
--

01000

Blat Code 0002-

**Preliminary Record  
Subject to Revision**

Remarks





Station identification number 09306061 Piceance Cr. at Hunter Cr. Water year 1979 TEMP

Card No. 01		DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	2	1	11.5						1							1
		2	10.9						2							2
		3	9.3						3							3
		4	10.1						4							4
		5	10.4						5							5
		6	10.6						6							6
		7	10.9						7							7
		8	10.8						8							8
3	4	9	11.1						9							9
		10	10.9						10							10
		11	11.1						11							11
		12	11.5						12							12
		13	9.6						13							13
		14	9.8						14							14
		15	9.5						15							15
		16	9.6						16							16
4	5	17	9.9						17							17
		18	10.4						18							18
		19	10.1						19							19
		20	9.4						20							20
		21	10.1						21							21
		22	10.6						22							22
		23	12.9						23							23
		24	14.6						24							24
4	5	25	12.4						25							25
		26							26							26
		27							27							27
		28							28							28
		29							29							29
		30							30							30
		31							31							31

TOTAL CHECK CARD

Type T Water year 1979

Total value (sum of daily value entries)

21	22	23	24	25	26	27	28	29	30	31

Per Code 00010  
Field Code 00000

Preliminary Record  
Subject to Revision

Remarks

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
 09306061 - PICEANCE CREEK AB HUNTER C. NEAR RIO BLANCO, CO. DISTRICT CODE 08  
 PROCESS DATE 10/03/78

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	TEMPER- ATURE (DEG C)	CODE FOR AGENCY ANALYZING SAMPLE	WEATHER *	SURFACE AREA (SQUARE MILES)	COLOR (PLAT- INUM- COBALT UNITS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	DIS- SOLVED OXYGEN (MG/L)	CHEM- ICAL OXYGEN DEMAND (HIGH LEVEL) (MG/L)	PH (UNITS)	CARBON DIOXIDE (CO2) (MG/L)	ALKA- LITY AS CACO3 (MG/L)
OCT 20...	1300	10.5	--	0	309	8	1410	12.9	--	8.3	4.8	490
NOV 15...	1015	5.4	--	0	309	8	1430	10.0	--	8.1	8.4	540
DEC 07...	1030	2.0	--	1	309	5	1450	10.0	1	8.3	4.4	450
JAN 16...	1200	2.0	--	1	309	6	1200	10.2	--	8.1	7.1	460
FEB 21...	1100	2.5	--	1	309	4	1250	10.6	--	8.2	5.9	480
MAR 29...	1100	7.0	--	0	309	25	1000	9.4	160	7.8	11	360
APR 17...	1000	4.5	--	1	309	10	875	10.0	--	8.2	4.2	340
MAY 18...	1040	7.5	--	1	309	11	1150	9.2	--	8.5	2.8	450
JUN 13...	1015	13.0	--	1	309	7	1500	8.1	19	8.3	4.5	460
AUG 15...	1100	14.5	80020	1	309	6	1450	10.2	--	8.3	4.7	480

\* 0 = Cloudless  
 1 = Partly Cloudy



PROCESS DATE 10/03/78  
DISTRICT CODE 08

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306061 - PICEANCE CREEK AB HUNTER C, NEAR RIO BLANCO, CO.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	TOTAL FILT- RABLE RESIDUE (MG/L)	TOTAL NUN- FILT- RABLE RESIDUE (MG/L)	OIL AND GREASE (MG/L)	DIS- SOLVED ORGANIC NITRO- GEN (N) (MG/L)	DIS- SOLVED AMMONIA NITRO- GEN (N) (MG/L)	DIS- SOLVED KJEL. NITRO- GEN (N) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	PHOS- PHATE (PO4) (MG/L)	DIS- SOLVED ORITHO PHOS- PHATE (PO4) (MG/L)	TOTAL PHOS- PHURUS (P) (MG/L)
OCT 20...	600	0	--	--	--	.20	.13	.33	.16	.06	.00	.02
NOV 15...	660	0	--	--	--	.26	.01	.27	.16	.12	.03	.04
DEC 07...	550	0	840	44	0	.21	.07	.28	.41	.18	.18	.06
JAN 16...	560	0	--	--	--	1.1	.00	1.1	.55	.21	.00	.07
FEB 21...	580	0	--	--	--	.13	.11	.24	.49	.21	.06	.07
MAR 29...	440	0	710	2600	0	.52	.17	.69	.56	5.5	.03	1.8
APR 17...	420	0	--	--	--	.57	.05	.62	1.2	2.9	.12	.94
MAY 18...	550	1	--	--	--	.65	.04	.69	.70	.58	.09	.19
JUN 13...	560	0	1080	2	0	.20	.00	.20	.33	.00	.03	.00
AUG 15...	590	0	--	--	--	.67	.02	.69	.28	.06	.03	.02

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
 09306061 - PIGEANCE CREEK AB HUNTER C, NEAR RIO BLANCO, CO. DISTRICT CODE 08  
 PROCESS DATE 10/03/78

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (MG/L)	DIS- SOL- VED ORGANIC CARBON (C) (MG/L)	SUS- PENDE D ORGANIC CARBON (C) (MG/L)	CYANIDE (CN) (MG/L)	TOTAL SUL- FIDE (S) (MG/L)	DIS- SUL- VED SUL- FIDE (S) (MG/L)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO
OCT 20....	.00	6.3	1.1	--	--	--	550	62	85	83	170	3.1
NOV 15....	.01	3.3	.5	--	--	--	580	37	85	89	160	2.9
DEC 07....	.06	3.7	1.0	.00	--	.0	520	70	87	73	150	2.9
JAN 16....	.00	2.7	1.0	--	--	--	480	22	84	66	130	2.6
FEB 21....	.02	11	.6	--	--	--	520	43	84	75	140	2.7
MAR 29....	.01	6.9	>5.0	.00	.6	--	400	40	74	52	130	2.8
APR 17....	.04	9.6	4.8	--	--	--	380	31	73	47	91	2.0
MAY 18....	.03	6.9	1.7	--	--	--	420	0	71	58	130	2.8
JUN 13....	.01	5.3	.3	.00	.0	--	430	0	42	78	190	4.0
AUG 15....	.01	7.2	.5	--	--	--	460	0	74	67	160	3.2

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
 09306061 - PICEANCE CREEK AB HUNTER C, NEAR RIO BLANCO, CO. DISTRICT CODE 08  
 PROCESS DATE 10/03/78

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	PERCENT SODIUM	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SI02) (MG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED BORON (B) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)
OCT 20...	40	2.9	13	380	.7	17	3	--	190	--	--	--
NOV 15...	37	2.8	15	360	.7	17	6	--	190	--	--	--
DEC 07...	39	2.5	12	330	.7	17	2	700	190	0	0	1
JAN 16...	37	2.4	14	300	.7	19	4	--	170	--	--	--
FEB 21...	37	2.5	14	290	.7	16	2	--	180	--	--	--
MAR 29...	41	3.3	27	260	.6	11	2	400	140	0	0	1
APR 17...	34	2.8	9.6	200	.5	14	3	--	120	--	--	--
MAY 18...	40	4.4	12	220	.7	17	2	--	170	--	--	--
JUN 13...	49	4.5	14	320	.8	18	3	300	230	0	10	2
AUG 15...	43	3.6	16	270	.8	17	1	--	230	--	--	--



UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
 09306061 - PICEANCE CREEK AB HUNTER C, NEAR RIO BLANCO, CO. DISTRICT CODE 08  
 PROCESS DATE 10/03/78

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MANGANESE (MN) (UG/L)	DIS- SOLVED MOLYB- DENUM (MO) (UG/L)	DIS- SOLVED STRON- TIUM (SR) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	DIS- SOLVED LITHIUM (LI) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	ATMOS- PHERIC ODOR (SEVER- ITY)	DIS- SOLVED GROSS BETA AS CS-137 (PC/L)	SUS- PENDED GROSS BETA AS CS-137 (PC/L)
OCT 20...	20	--	170	--	--	--	--	--	--	0	--	--
NOV 15...	30	--	230	--	--	--	--	--	--	0	--	--
DEC 07...	100	1	100	4	2700	20	120	20	0	0	<2.4	1.8
JAN 16...	20	--	60	--	--	--	--	--	--	0	--	--
FEB 21...	50	--	50	--	--	--	--	--	--	0	--	--
MAR 29...	10	2	120	91	1700	0	50	20	2	0	24	120
APR 17...	20	--	20	--	--	--	--	--	--	0	--	--
MAY 18...	70	--	50	--	--	--	--	--	--	0	--	--
JUN 13...	70	7	110	8	2500	20	0	20	0	0	4.8	<.4
AUG 15...	30	--	50	--	--	--	--	--	--	0	--	--

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
 09306061 - PICEANCE CREEK AB HUNTER C, NEAR RIO BLANCO, CO. DISTRICT CODE 08  
 PROCESS DATE 10/03/78

WATER QUALITY DATA. WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED RA-226 (RADON METHOD) (PC/L)	DIS- SOLVED NATURAL URANIUM (U) (UG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL. 7UM-MF (COL./ 100 ML)	STREP- TOCOCCHI (COL- ONIES PER 100 ML)	PHENOLS (UG/L)	METHY- LENE BLUE ACTIVE SUB- STANCE (MG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	DOD IN BOTTOM MA- TERIAL (UG/KG)	DOE IN BOTTOM MA- TERIAL (UG/KG)
OCT 20...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 15...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 07...	.11	2.4	41	<2	43	1	--	--	--	--	--	--
JAN 16...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 21...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 29...	.10	4.2	--	--	--	0	.00	.0	.0	0	1.5	1.2
APR 17...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 18...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 13...	.07	5.0	21	K15	--	1	--	--	--	--	--	--
AUG 15...	--	--	--	--	--	--	--	--	--	--	--	--

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306061 - PICEANCE CREEK AB HUNTER C, NEAR RIO BLANCO, CO. DISTRICT CODE 08

PROCESS DATE 10/03/78

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DDT IN BOTTOM MA- TERIAL (UG/KG)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	ETHION IN BOTTOM MA- TERIAL (UG/KG)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)	PCH IN BOTTOM MA- TERIAL (UG/KG)	MALA- THION IN BOTTOM MA- TERIAL (UG/KG)	PARA- THION IN BOTTOM MA- TERIAL (UG/KG)	DI- AZINON IN BOTTOM MA- TERIAL (UG/KG)	METHYL PARA- THION IN BOT- TOM MA- TERIAL (UG/KG)
OCT 20...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 15...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 07...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 16...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 21...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 29...	1.2	.1	.0	.0	0	.0	.0	0	.0	.0	.0	.0
APR 17...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 18...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 13...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 15...	--	--	--	--	--	--	--	--	--	--	--	--



UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
 09306061 - PICEANCE CREEK AB HUNTER C, NEAR RIO BLANCO, CO. DISTRICT CODE 08  
 PROCESS DATE 10/03/78

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	2,4-D IN BOTTOM MA- TERIAL (UG/KG)	2,4,5-T IN BOTTOM MA- TERIAL (UG/KG)	SILVEX IN BOTTOM MA- TERIAL (UG/KG)	TRI- THION IN BOTTOM MA- TERIAL (UG/KG)	METHYL TRI- THION IN BOT- TOM MA- TERIAL (UG/KG)	DIS- SOLVED SOLIDS (SUM OF CONSTITU- ENTS) (MG/L)	DIS- SOLVED SOLIDS (TONS PER AC-FT)	DIS- SOLVED AMMONIA (NH <sub>4</sub> ) (MG/L)	BROMIDE (BR) (MG/L)
OCT 20...	--	--	--	--	--	1050	1.43	.17	--
NOV 15...	--	--	--	--	--	1060	1.44	.01	--
DEC 07...	--	--	--	--	--	950	1.29	.09	.1
JAN 16...	--	--	--	--	--	895	1.22	.00	--
FEB 21...	--	--	--	--	--	911	1.24	.14	--
MAR 29...	0	0	0	.0	.0	780	1.06	.22	.1
APR 17...	--	--	--	--	--	650	.88	.06	--
MAY 18...	--	--	--	--	--	789	1.07	.05	--
JUN 13...	--	--	--	--	--	948	1.29	.00	.2
AUG 15...	--	--	--	--	--	901	1.23	.03	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED MERCURY (HG) (UG/L)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE MSL)	DIS- SOLVED GROSS ALPHA AS U-NAT. (UG/L)	SUS- PENDED GROSS ALPHA AS U-NAT. (UG/L)	DIS- SOLVED GROSS BETA AS SR90 /Y90 (PC/L)	SUS- PENDED GROSS BETA AS SR90 /Y90 (PC/L)
OCT 20...	--	6214.00	--	--	--	--
NOV 15...	--	6214.00	--	--	--	--
DEC 07...	.0	6214.00	<7.6	<.7	<2.1	1.7
JAN 16...	--	6214.00	--	--	--	--
FEB 21...	--	6214.00	--	--	--	--
MAR 29...	.0	6214.00	23	200	21	110
APR 17...	--	6214.00	--	--	--	--
MAY 18...	--	6214.00	--	--	--	--
JUN 13...	.0	6214.00	<8.9	<.4	4.3	<.4
AUG 15...	--	6214.00	--	--	--	--

USGS WATER GAUGING STATION 09306200  
Piceance Creek Below Ryan Gulch

A. Water Quality Data  
Process Date 10/3/78



UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
 09306200 - PICEANCE CREEK BL RYAN GULCH, NR RIO BLANCO, CO. DISTRICT CODE 08  
 PROCESS DATE 10/03/78

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	TEMPER- ATURE (DEG C)	CODE FOR AGENCY ANALYZING SAMPLE	SURFACE AREA (SQUARE MILES)	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	DIS- SOLVED OXYGEN (MG/L)	PH (UNITS)	CARBON DIOXIDE (CO2) (MG/L)	ALKA- LITY AS CACO3 (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)
OCT 18...	1445	12.0	--	485	15	1750	8.4	8.9	1.2	500	610	1
NOV 28...	1300	5.0	--	485	14	1550	--	8.1	8.1	530	640	0
DEC 29...	1405	5.0	--	485	15	1510	11.2	8.2	5.9	480	580	0
FEB 14...	1245	1.5	--	485	16	1500	12.3	8.1	6.8	490	600	0
MAR 23...	0940	6.0	--	485	29	1450	12.0	7.8	14	500	610	0
APR 19...	1320	10.5	--	485	34	1150	12.2	8.4	3.1	400	490	1
MAY 22...	1410	20.0	--	485	23	1700	12.2	7.7	23	580	710	0
JUN 15...	1445	21.5	--	485	9.5	1600	9.4	7.1	103	660	810	0
AUG 14...	1330	14.0	80020	485	11	1700	9.8	7.9	15	590	720	0

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
 09306200 - PICEANCE CREEK BL RYAN GULCH, NR RIO BLANCO, CO. DISTRICT CODE 08  
 PROCESS DATE 10/03/78

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED ORGANIC NITRO- GEN (N) (MG/L)	DIS- SOLVED AMMONIA NITRO- GEN (N) (MG/L)	DIS- SOLVED NITRITE (N) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED KJEL. NITRO- GEN (N) (MG/L)	TOTAL KJEL- DAHL NITRO- GEN (N) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOLVED ORHO PHOS- PHATE (P04) (MG/L)	DIS- SOLVED ORHO. PHOS- PHORUS (P) (MG/L)	HARD- NESS (CA,MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)
OCT 18....	--	.02	.00	.03	--	.44	.03	.00	.00	680	180
NOV 28....	--	.06	.00	.38	--	.55	.39	.06	.02	610	87
DEC 29....	--	.09	.00	.43	--	.56	.43	.03	.01	570	94
FEB 14....	--	.06	.01	.34	--	--	.34	.06	.02	580	90
MAR 23....	.74	.09	.04	.56	.83	--	.61	.03	.01	580	80
APR 19....	--	.05	.02	.97	--	1.1	.98	.12	.04	440	32
MAY 22....	--	.00	.01	.27	--	--	.27	.18	.06	570	0
JUN 15....	--	.00	.01	.00	--	1.9	.01	.00	.00	680	15
AUG 14....	--	.00	.00	.01	--	.51	.01	.03	.01	610	18

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
 09J06200 - PICEANCE CREEK BL RYAN GULCH, NR RIO BLANCO, CO. DISTRICT CODE 08

PROCESS DATE 10/03/78

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	PERCENT SODIUM	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SI02) (MG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)
OCT 18...	88	110	200	3.4	39	3.0	32	510	.7	17	2
NOV 28...	90	93	200	3.5	42	3.3	17	430	.7	18	4
DEC 29...	88	84	170	3.1	39	2.7	13	430	.8	18	2
FEB 14...	88	87	170	3.1	39	2.6	16	370	.8	17	2
MAR 23...	86	88	160	2.9	37	3.1	15	350	.7	14	3
APR 19...	78	58	120	2.5	37	3.3	15	230	.6	15	4
MAY 22...	81	89	210	3.8	44	5.4	22	400	.8	19	3
JUN 15...	89	110	270	4.5	46	4.6	23	500	.9	16	5
AUG 14...	79	99	250	4.4	47	3.8	24	490	.9	17	3



UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
 09306200 - PICEANCE CREEK BL RYAN GULCH, NR RIO BLANCO, CO. DISTRICT CODE 08  
 PROCESS DATE 10/03/78

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED BORON (B) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MANGANESE (MN) (UG/L)	DIS- SOLVED MOLYB- DENUM (MO) (UG/L)	DIS- SOLVED STRON- TIUM (SR) (UG/L)	DIS- SOLVED VANA- DIUM (V) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
OCT 18...	100	230	0	1	80	3	100	--	4000	--	0
NOV 28...	0	210	1	3	30	2	100	--	3500	--	10
DEC 29...	100	190	1	0	20	3	70	5	3300	5.0	10
FEB 14...	300	170	1	0	40	9	60	--	3300	--	10
MAR 23...	200	180	0	4	110	2	90	7	2900	4.0	30
APR 19...	0	170	1	13	40	5	10	--	1900	--	10
MAY 22...	200	270	2	7	10	8	50	--	2800	--	20
JUN 15...	200	320	0	0	30	3	170	12	3400	2.0	10
AUG 14...	70	300	<1	1	10	9	20	--	3500	--	9

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED LITHIUM (LI) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	ATMOS- PHERIC ODOR (SEVER- ITY)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L)	DIS- SOLVED SOLIDS (TONS PER DAY)	DIS- SOLVED SOLIDS (TONS PER AC-FT)	DIS- SOLVED AMMONIA (NH4) (MG/L)	DIS- SOLVED NITRATE (NO3) (MG/L)	DIS- SOLVED NITRITE (NO2) (MG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE MSL)
OCT 18...	8	0	1	1270	53.8	1.73	.03	.10	.00	.0	6070.00
NOV 28...	20	1	1	1170	47.1	1.59	.08	1.7	.00	.0	6070.00
DEC 29...	20	1	1	1100	45.4	1.50	.12	1.9	.03	.0	6070.00
FEB 14...	10	1	1	1050	46.8	1.43	.08	1.5	.03	.0	6070.00
MAR 23...	20	3	--	1020	80.4	1.39	.12	2.5	.13	.0	6070.00
APR 19...	20	1	1	769	70.6	1.05	.06	4.3	.07	.0	6070.00
MAY 22...	7	0	1	1180	73.3	1.60	.00	1.2	.03	.0	6070.00
JUN 15...	10	1	--	1420	36.4	1.93	.00	.00	.03	.0	6070.00
AUG 14...	10	1	--	1320	42.1	1.80	.00	.04	.00	.0	6070.00

USGS WATER GAUGING STATION 09306222  
Piceance Creek at White River

A. Water Quality Data  
Process Date 10/3/78



UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306222 - PICEANCE CREEK AT WHITE RIVER, CO.

PROCESS DATE 10/03/78  
DISTRICT CODE 08

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	TEMPER- ATURE (DEG C)	CODE FOR AGENCY	SURFACE AREA (SQUARE MILES)	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	DIS- SOLVED OXYGEN (MG/L)	PH (UNITS)	CARBON DIOXIDE (CO2) (MG/L)	ALKA- LITY AS CACO3 (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)
OCT 18...	1300	9.5	--	629	32	2800	8.9	8.7	3.6	920	1120	1
NOV 22...	1215	.5	--	629	35	1950	--	7.7	28	710	870	0
DEC 28...	1345	.5	--	629	13	2000	--	8.1	11	710	860	0
MAR 27...	1030	8.0	--	629	28	2000	14.2	8.1	11	740	900	0
APR 19...	1225	9.5	--	629	26	1500	--	8.2	6.1	560	680	0
MAY 22...	1230	18.0	--	629	8.0	3600	11.2	7.4	90	1160	1420	0
JUN 15...	1245	22.0	--	629	7.5	3800	12.6	7.5	110	1790	2180	0
JUL 25...	1000	18.0	80020	629	5.5	3750	16.0	8.8	5.3	1720	1830	130

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306222 - PICEANCE CREEK AT WHITE RIVER, CO.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

II A-157

PROCESS DATE 10/03/78  
DISTRICT CODE 08

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306222 - PICFANCE CREEK AT WHITE RIVER, CO.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	SODIUM AD- SORP- TION RATIO	PERCENT SODIUM	DIS- SOLVED PO- TAS- SIUM (P)	DIS- SOLVED CHLO- RIDE (CL)	DIS- SOLVED SULFATE (SO4)	DIS- SOLVED FLUO- RIDE (F)	DIS- SOLVED SILICA (SI02)	DIS- SOLVED ARSENIC (AS)	DIS- SOLVED BARIUM (BA)	DIS- SOLVED BORON (B)	DIS- SOLVED CAD- MIUM (CD)
OCT 18....	7.2	59	3.9	53	520	1.3	15	4	100	390	1
NOV 22....	5.3	53	4.2	33	420	1.0	17	31	100	0	1
DEC 24....	6.9	63	3.1	39	370	1.3	17	3	100	290	2
JAN 27....	5.9	54	3.7	69	450	1.0	14	5	300	280	0
APR 19....	4.6	52	3.6	33	270	.9	15	4	0	240	1
MAY 22....	11	69	6.4	75	740	1.5	16	5	200	500	8
JUN 15....	18	79	6.7	160	600	2.9	12	5	200	790	0
JUL 25....	19	81	5.2	130	590	3.5	10	9	300	820	2



UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306222 - PICEANCE CREEK AT WHITE RIVER, CO.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	HEXA- VALENT CHRO- MIUM (CR6) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MANGANESE (MN) (UG/L)	DIS- SOLVED MOLYB- DENUM (MO) (UG/L)	DIS- SOLVED STRON- TIUM (SR) (UG/L)	DIS- SOLVED VANA- DIUM (V) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)
OCT 18...	10	0	2	250	3	70	--	3000	--	20	180
NOV 22...	4	0	2	90	3	80	--	2900	--	20	80
DEC 28...	0	0	3	50	11	40	6	2100	5.5	0	10
MAR 27...	0	3	0	480	2	40	8	2900	6.0	10	40
APR 19...	0	0	15	20	4	20	--	2000	--	10	0
MAY 22...	10	0	24	40	11	30	--	2600	--	40	0
JUN 15...	0	0	0	60	0	30	16	2300	7.0	10	20
JUL 25...	0	0	3	50	21	10	--	2000	--	20	10

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY  
09306222 - PICEANCE CREEK AT WHITE RIVER, CO.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	DIS- SOLVED LITHIUM (LI) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	ATMOS- PHERIC ODOR (SEVER- ITY)	DIS- SOLVED SOLIDS (SUM OF CONSTIT- TUENTS) (MG/L)	DIS- SOLVED SOLIDS (TONS PER DAY)	DIS- SOLVED AMMONIA (NH4) (MG/L)	DIS- SOLVED NITRATE (NO3) (MG/L)	DIS- SOLVED NITRITE (NO2) (MG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE MSL)
OCT 18...	40	0	1	1730	150	.03	.30	.00	.0	5730.00
NOV 22...	40	2	1	1370	131	.36	2.0	.03	.0	5730.00
DEC 28...	30	1	1	1310	46.0	.21	1.9	.03	.0	5730.00
MAR 27...	40	3	--	1500	117	.17	1.6	.03	.0	5730.00
APR 19...	30	1	1	1020	71.6	.10	4.3	.07	.1	5730.00
MAY 22...	50	0	1	2340	50.5	.17	1.2	.03	.0	5730.00
JUN 15...	90	2	1	2980	60.3	.00	.40	.03	.0	5730.00
JUL 25...	100	1	1	2870	42.6	.00	.09	.03	.0	5730.00

USGS WATER GAUGING STATION 09306015  
Cottonwood Gulch Near Rio Blanco

A. DAILY TABLES

1. Gauge Height
2. Specific Conductance
3. Temperature



Daily Gage Height, in Feet, and Discharge, in Second-Foot, of Middle Fork St. Mary's River  
Kio Blanco, Colorado, for the Year Ending September 30, 1978.

UNITED STATES  
 DEPARTMENT OF THE INTERIOR  
 GEOLOGICAL SURVEY  
 WATER RESOURCES DIVISION

Station 09306015  
 Name Kio Blanco, The Number 000000  
 Used rating table dated 1/10/1

Drainage Area 1,111.1 Square Miles. Water-Stage Recorder CANTINUCUS Ratio 1:1.6

Gage Read to Once a Day by and Gage height used to half inch between hundredths below and tenths above these limits.

Date	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	April	MAY		JUNE		JULY		AUGUST		SEPTEMBER		Year
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Year
1																							1978
2																							
3																							
4																							
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28																							
29																							
30																							
31																							
TOTAL																							
Mean	Second-foot per square mile																						
Base of	in inches																						
Base of	in feet																						
Maximum																							
Minimum																							





# Coding Form for Input a      date of Daily Values--Continued

Station Identification number 0000015

WIPOLIS FOUNTAIN NR RIO GRANDE Water year 1978

COND MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
9							9							9
10							10							10
11							11							11
12							12							12
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26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Total value (sum of daily value entries)

Type ☒ T      Water year 1978

21      32

Raw Sodo 00000  
Stat Code 00000

COND.  
Preliminary Record  
Subject to Revision

Remarks





# Coding Form for Input and date of Daily Values--Continued

1978

Water year

1978

Station identification number

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
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28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type ☐ T ☐ 1  
Water year 1978 20

Total value (sum of daily value entries) 21

Tax Code 32 Stat Code 32

Preliminary Record  
Subject to Revision

Remarks



# Coding Form for Input a. Update of Daily Values--Continued

Station identification number 09306015 M. F. Stewart Guich

Water year 1979

COND MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
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8							8							8
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27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Total value (sum of daily value entries)

Type T 1 17 1979 20

Preliminary Record Subject to Revision

Par Code 00095 COND  
Stat Code 00002 MIN

Remarks



# Coding Form for Input      Update of Daily Values--Continued

Station identification number 19300000 MIDDLE FORK STEAM TUN RIO BLANCO Water year 1998 GRND MEAN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
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30							30							30
31							31							31

TOTAL CHECK CARD

Type T 1 Water year 1998 20

Total value (sum of daily value entries)

21 32,000,000,000,000

Remarks

Preliminary Record  
Subject to Revision

CONV D.  
MEAN

# Coding Form for Input of Date of Daily Values--Continued

03206015 M. F. Stewart Gulch

Station Identification number

Water year

1979

CONO MEAN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
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30							30							30
31							31							31

Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Type ☒ T ☐ W

Water year  1979

Total value (sum of daily value entries)  21

Per Totals 00095 CONO  
Preliminary Record Stat Code 00003 MEAN  
Subject to Revision

Remarks



Coding Form for Input and Date of Daily Values--Continued

Station identification number

MIDDLE FORK STREAM AT NEW FULFORD

Water year 1978

TEMP MAY

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
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29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type ☒ T Water year 1978

Total value (sum of daily value entries) 21 32

Remarks

TEMP MAY  
PRELIMINARY DATA  
SUBJECT TO REVISION



Station identification number 09306015 M. F. Stewart Gulch

Water year 1979

TEMP MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
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24							24							24
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27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

NO FLOW

TOTAL CHECK CARD

Type T

Water year 1979

Total value (sum of daily value entries) 21

32 Preliminary Record  
Subject to Revision

Bar Code 00010 Temp  
Unit Code 00001 YMAX

Remarks

Coding Form for Input and Update of Daily Values--Continued

Station identification number 0006015 MIDDLE FURK STEADY UP NO FLOOD Water year 1978 TEMP MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
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22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type ☐ T ☐ 1 Water year 1978 20

Total value (sum of daily value entries) 00010

TEMP  
The minimum Record  
Subject to P...

Remarks



# Coding Form for Input at date of Daily Values--Continued

Station Identification number 09306015 M. F. Stewart Gulch Water year 1979 TEMP MIN

CARD NO.	DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1							1							1
	2							2							2
	3							3							3
	4							4							4
	5							5							5
	6							6							6
	7							7							7
	8							8							8
Card No. 02	9							9							9
	10							10							10
	11							11							11
	12							12							12
	13							13							13
	14							14							14
	15							15							15
	16							16							16
Card No. 03	17							17							17
	18							18							18
	19							19							19
	20							20							20
	21							21							21
	22							22							22
	23							23							23
	24							24							24
Card No. 04	25							25							25
	26							26							26
	27							27							27
	28							28							28
	29							29							29
	30							30							30
	31							31							31

NO FLOW

TOTAL CHECK CARD

Type ☒ T ☐ 1 Water year  17 20

Total value (sum of daily value entries)  21  32

Par Code 00010 Temp  
Preliminary Record  
Subject to Revision

Remarks



# Coding Form for Input and date of Daily Values--Continued

Station Identification number 09206015

WIDDLE FOCK STEEL PUMP W.R. L. RAPER

Water year 1978

TEMP TEMP

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
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26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Type ☒ T ☐ 1

Water year  17  20

Total value (sum of daily value entries)  21  32

Par Code 000000  
Stat Code 000003

Preliminary Record  
Subject to Revision TEMP  
MEAN

Remarks

# Coding Form for Input and date of Daily Values--Continued

09306015 M. F. Stewart Guich

Station identification number

Water year 1979

TEMP M. APP

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
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27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Type T 1 17 19 20

Total value (sum of daily value entries) 21 32

Stat Code 00010 TEMP  
Preliminary Record Stat Code 00003 MEAN  
Subject to Revision

Remarks

USGS WATER GAUGING STATION 09306025  
Cottonwood Gulch Near Rio Blanco

A. DAILY TABLES

1. Gauge Height
2. Specific Conductance
3. Temperature









# Coding Form for Input at date of Daily Values--Continued

Station Identification number 00360005

W.F. Stewart JR NO RPTD

Water year 1978

CONDO MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
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8							8							8
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25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Total value (sum of daily value entries)

Type ☐ T ☐ 1

Water year 1978 20

Par Code 1000

Stat Code 1000

CON'D  
MAX

Remarks



09306025 W. F. Stewart Gulch

Coding Form for Input ar

date of Daily Values--Continued

Station identification number

Water year 1979

COND max

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
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5							5							5
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27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Total value (sum of daily value entries)

Type T Water year 1979

21	22	23	24	25	26	27	28	29	30	31	32
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Par Code 00095 COND  
Stat Code 00001 max

Preliminary Record  
Subject to Revision

Remarks

# Coding Form for Input ar "date of Daily Values--Continued

Station identification number

3003025  
W.F. STEWART NW RD 141100

Water year 1978

COND MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
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25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

Total value (sum of daily value entries)

Par Code 000000  
Stat Code 000000

Preliminary Final COND  
Subject to Review min

Remarks







# Coding Form for Input ar.      date of Daily Values--Continued

Station Identification number 09206525

W.F. SPENCER JR P.O. D.P. 200

Water year 1978

COND N. APP

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
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4							4							4
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29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type T 1

Water year 1978 20

Total value (sum of daily value entries)

21	22	23	24	25	26	27	28	29	30	31

32

Par Code ---

Stat Code ---

Profile Survey and Cond  
Subject to National Mean

Remarks

# Coding Form for Input and Update of Daily Values--Continued

09305025 W. F. Stewart Gulch

Station identification number

Water year 1979

COND mean

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1													1
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31													31

TOTAL CHECK CARD

Total value (sum of daily value entries)

Type T 1 Water year 1979 20

Preliminary Record  
Subject to Revision

Par Code 0009560000  
Stat Code 000003 MEAN

Remarks



# Coding Form for Input ar ddate of Daily Values--Continued

Station identification number 02006025 W.F. Stewart JR 130 River Water year 1978 TEMP MAX

CARD NO.	DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1							1							1
	2							2							2
	3							3							3
	4							4							4
	5							5							5
	6							6							6
	7							7							7
	8							8							8
Card No. 02	9							9							9
	10							10							10
	11							11							11
	12							12							12
	13							13							13
	14							14							14
	15							15							15
	16							16							16
Card No. 03	17							17							17
	18							18							18
	19							19							19
	20							20							20
	21							21							21
	22							22							22
	23							23							23
	24							24							24
Card No. 04	25							25							25
	26							26							26
	27							27							27
	28							28							28
	29							29							29
	30							30							30
	31							31							31

NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

Par Code 0000  
 Max Code 0001

Total value (sum of daily value entries)  
 21 32

Type T 1  
 Water year 1978 20

TOTAL CHECK CARD

TEMP  
 MAX

Remarks



00306025 W. F. Stewart Gulch

date of Daily Values--Continued

Station identification number

Water year

TEMP max

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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30							30							30
31							31							31

TOTAL CHECK CARD

Type T 1

Water Year 1977 20

Total value (sum of daily value entries) 21

Par Code 00010 Temp max  
Stat Code 00001

Preliminary Subject to Revision

Remarks

# Coding Form for Input and Update of Daily Values--Continued

Station identification number

09506025 W.F. Stewart Jr. No. 1000

Water year

1978

TEMP MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
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30							30							30
31							31							31

TOTAL CHECK CARD

Type ☐ T ☐ W Water year 1978

Total value (sum of daily value entries) 21 32

Par Code 1000 Stat Code 1000

TEMP MIN Preliminary Record Subject to Revision

Remarks



# Coding Form for Input and Update of Daily Values--Continued

99306025 W. F. Stewart Gulch

Station identification number

Water year 1979

Temp min

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
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30							30							30
31							31							31

NO FLOW

Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Type ☒ T ☐ 1 Water Year 1979 20

Total value (sum of daily value entries)

21									
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Far Code 00010 Temp min  
Stat Code 00002

Preliminary Record  
Subject to Revision

Remarks



# Coding Form for Input and Update of Daily Values--Continued

Station Identification number 0000025

W.F. Stewart on No. 12

Water year 1978

TEMP

TEMP

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
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28							28							28
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30							30							30
31							31							31

TOTAL CHECK CARD

Type T

Water year 1977

Total value (sum of daily value entries) 21

Raw Code 00010

Preliminary Revised Temp  
Subject to Final A mean

Remarks

# Coding Form for Input at date of Daily Values--Continued

09306025 W. F. Stewart Guich

Station identification number

Water year 1979

TEMP MEAN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
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30							30							30
31							31							31

TOTAL CHECK CARD

Type T 1  
Water year 1979 20

Total value (sum of daily value entries) 21

Stat Code 00010 Temp  
Stat Code 00003 mean

Remarks

USGS WATER GAUGING STATION 09306028  
Cottonwood Gulch Near Rio Blanco

A. DAILY TABLES

1. Gauge Height
2. Specific Conductance
3. Temperature



41 Star RIO BLANCO, COLORADO for the Year Ending September 30, 1978.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION

GULCH & MOUTH  
N.R. RIO BLANCO,  
COLO.

Drainage Area	Square Miles	Water-Stage Recorder	CONTINUOUS	Ratio	1 : 6...
1	1.0	1	1	1	1
2	2.0	2	2	2	2
3	3.0	3	3	3	3
4	4.0	4	4	4	4
5	5.0	5	5	5	5
6	6.0	6	6	6	6
7	7.0	7	7	7	7
8	8.0	8	8	8	8
9	9.0	9	9	9	9
10	10.0	10	10	10	10
11	11.0	11	11	11	11
12	12.0	12	12	12	12
13	13.0	13	13	13	13
14	14.0	14	14	14	14
15	15.0	15	15	15	15
16	16.0	16	16	16	16
17	17.0	17	17	17	17
18	18.0	18	18	18	18
19	19.0	19	19	19	19
20	20.0	20	20	20	20
21	21.0	21	21	21	21
22	22.0	22	22	22	22
23	23.0	23	23	23	23
24	24.0	24	24	24	24
25	25.0	25	25	25	25
26	26.0	26	26	26	26
27	27.0	27	27	27	27
28	28.0	28	28	28	28
29	29.0	29	29	29	29
30	30.0	30	30	30	30
31	31.0	31	31	31	31
32	32.0	32	32	32	32
33	33.0	33	33	33	33
34	34.0	34	34	34	34
35	35.0	35	35	35	35
36	36.0	36	36	36	36
37	37.0	37	37	37	37
38	38.0	38	38	38	38
39	39.0	39	39	39	39
40	40.0	40	40	40	40
41	41.0	41	41	41	41
42	42.0	42	42	42	42
43	43.0	43	43	43	43
44	44.0	44	44	44	44
45	45.0	45	45	45	45
46	46.0	46	46	46	46
47	47.0	47	47	47	47
48	48.0	48	48	48	48
49	49.0	49	49	49	49
50	50.0	50	50	50	50
51	51.0	51	51	51	51
52	52.0	52	52	52	52
53	53.0	53	53	53	53
54	54.0	54	54	54	54
55	55.0	55	55	55	55
56	56.0	56	56	56	56
57	57.0	57	57	57	57
58	58.0	58	58	58	58
59	59.0	59	59	59	59
60	60.0	60	60	60	60
61	61.0	61	61	61	61
62	62.0	62	62	62	62
63	63.0	63	63	63	63
64	64.0	64	64	64	64
65	65.0	65	65	65	65
66	66.0	66	66	66	66
67	67.0	67	67	67	67
68	68.0	68	68	68	68
69	69.0	69	69	69	69
70	70.0	70	70	70	70
71	71.0	71	71	71	71
72	72.0	72</			

Once a Day by . . . . . Twice

page heights used to half to other between and surrounded by below and ten to above these limits

Date	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		TOTAL	Remarks
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge		
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29																										
30																										
31																										
TOTAL																										

FOR "A" - NO GAGE HEIGHT RECORD, "O" - ICE EFFECT, \* - OBSERVED  
S-DISCHARGE SUBDIVIDED, V-VARIABLE SHEET, DISCHARGE ESTIMATED

Max Disch \_\_\_\_\_ Sec ft on \_\_\_\_\_

Max Disch \_\_\_\_\_ Sec ft on \_\_\_\_\_

1977

Drainage Area Square Miles. Water-Stage Recorder. Ratio 1:6  
 Once a Day by  
 Gage Read to  
 Gage height used to half tenths between and below hundredths below and tenths above these limits.

Day	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		Day
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	
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OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		Total
Gage height		Gage height		Gage height		Gage height		Gage height		Gage height		Gage height		Gage height		Gage height		Gage height		Gage height		Gage height		
Discharge		Discharge		Discharge		Discharge		Discharge		Discharge		Discharge		Discharge		Discharge		Discharge		Discharge		Discharge		
Mean		Mean		Mean		Mean		Mean		Mean		Mean		Mean		Mean		Mean		Mean		Mean		
Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile		Second feet per square mile		
Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches		Runoff in inches		
Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		Runoff in acre-feet		
Maximum		Maximum		Maximum		Maximum		Maximum		Maximum		Maximum		Maximum		Maximum		Maximum		Maximum		Maximum		
Minimum		Minimum		Minimum		Minimum		Minimum		Minimum		Minimum		Minimum		Minimum		Minimum		Minimum		Minimum		

BELMONT RECORD  
 SUBJECT TO REVISION







Preliminary and  
Subject to Revision

COND MAX

Update of Daily Values--Continued

1979

Water year

Coding Form for Input at  
Stewart Gulch at mouth

09306028 W. F. Stewart

Station identification number

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
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30							30							30
31							31							31

Var Code 00095 COND  
Stat Code 06201 MAX

Total value (sum of daily value entries)  
21 32

Type T 1  
Water year 17 20

TOTAL CHECK CARD

Remarks





Preliminary Report  
Subject to Revision

Coding Form for Input at date of Daily Values--Continued

09306028 W. F. Stewart Quick at Mouth

Water year 1979

Station identification number

COND MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
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29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type ☐ T ☐ 1

Water year ☐ 17 ☐ 20

Total value (sum of daily value entries) ☐ 21 ☐ 32

For Total COND  
COND MIN

Remarks



## Update of Daily Values--Continued

Water year 1978

COND MATH

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
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30							30							30
31							31							31

Total value (sum of daily value entries)

Type	T	1
Water year	1978	17 20

TOTAL CHECK CARD

Total value (sum of daily value entries)	21	32
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Par Code 000003  
Stat Code 000003

COND  
Preliminary Record  
Subject to Review

Remarks

# Coding Form for Input at

09306028 W. F. Stewart Gulch at mouth

Station identification number

09306028 W. F. Stewart Gulch at mouth

Card No. 01

Card No. 02

Card No. 03

Card No. 04

Card No. 05

Card No. 06

Card No. 07

Card No. 08

Card No. 09

Card No. 10

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Card No. 279



# Coding Form for Input and date of Daily Values--Continued

Station identification number 19200028

Dr. Stewart Water at Point at mouth

Water year 1978

TEMP MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
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28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Total value (sum of daily value entries)

21
32

Type ☐ T ☐ 1

Water year 1978

Per Code 0010

Water Code 0011

Dr. Stewart 1978 TEMP  
Subject to Revision MAX

Remarks



Station identification number  
09306028 W. F. Stewart Gulch at mouth.  
Coding Form for Input and  
date of Daily Values--Continued  
Preliminary Record  
Subject to Revision  
Water year 1979  
TEMP MAX

CARD NO.	DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1							1							1
	2							2							2
	3							3							3
	4							4							4
	5							5							5
	6							6							6
	7							7							7
	8							8							8
Card No. 02	9							9							9
	10							10							10
	11							11							11
	12							12							12
	13							13							13
	14							14							14
	15							15							15
	16							16							16
Card No. 03	17							17							17
	18							18							18
	19							19							19
	20							20							20
	21							21							21
	22							22							22
	23							23							23
	24							24							24
Card No. 04	25							25							25
	26							26							26
	27							27							27
	28							28							28
	29							29							29
	30							30							30
	31							31							31

Station identification number  
09306028 W. F. Stewart Gulch at mouth.  
Coding Form for Input and  
date of Daily Values--Continued  
Preliminary Record  
Subject to Revision  
Water year 1979  
TEMP MAX

Station identification number  
09306028 W. F. Stewart Gulch at mouth.  
Coding Form for Input and  
date of Daily Values--Continued  
Preliminary Record  
Subject to Revision  
Water year 1979  
TEMP MAX

Station identification number  
09306028 W. F. Stewart Gulch at mouth.  
Coding Form for Input and  
date of Daily Values--Continued  
Preliminary Record  
Subject to Revision  
Water year 1979  
TEMP MAX

Station identification number  
09306028 W. F. Stewart Gulch at mouth.  
Coding Form for Input and  
date of Daily Values--Continued  
Preliminary Record  
Subject to Revision  
Water year 1979  
TEMP MAX

Station identification number  
09306028 W. F. Stewart Gulch at mouth.  
Coding Form for Input and  
date of Daily Values--Continued  
Preliminary Record  
Subject to Revision  
Water year 1979  
TEMP MAX

# Coding Form for Input and Update of Daily Values--Continued

Station identification number 028 W.F. Stewart Gulch to road Water year 1978 TEMP MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
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30							30							30
31							31							31

TOTAL CHECK CARD  
 Type T Water year 1978  
 Total value (sum of daily value entries) 21  
 Par Codo 0000 Stat Codo 0000  
 Preliminary Record MIN Subject to Revision MIN

Remarks



Preliminary Record  
Subject to Revi

Coding Form for Input at date of Daily Values--Continued

Station identification number 09306028 W. F. Stewart Gulch at mouth

Water year 1979

TEMP MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
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30							30							30
31							31							31

TOTAL CHECK CARD

Type T 1

Water year 17 20

Total value (sum of daily value entries) 21 32

Temp Code 00010 temp  
Stat Code 00000 min

Remarks



Coding Form for Input and Date of Daily Values--Continued

Water year 1978

TEMP MEAN

Station identification number 20206028

W. Stewart Lake (2) 1100 ft

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
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30							30							30
31							31							31

Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Total value (sum of daily value entries)

Water year 1978

Type T

1

17

20

21

22

23

24

25

26

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Coding Form for Input at date, of Daily Values--Continued

Preliminary R. d.  
Subject to Revision

Water year 1979

Station identification number 09306028 W. F. Stewart Gulch at mouth

Card No. 01

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
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8							8							8
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12							12							12
13							13							13
14							14							14
15							15							15
16							16							16
17							17							17
18							18							18
19							19							19
20							20							20
21							21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Type ☒ T

Water year 1979

Total value (sum of daily value entries)

21 20 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

32

00010 temp

00003 mean

Remarks

USGS WATER GAUGING STATION 09306033  
Cottonwood Gulch Near Rio Blanco

A. DAILY TABLES

1. Gauge Height
2. Specific Conductance
3. Temperature









Coding Form for Input and Update of Daily Values--Continued

Station identification number 0000033

WATER YEAR 1978

Water year 1978

TEMP MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2					NO DATA		2
3							3					NO DATA		3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
9							9							9
10							10							10
11							11							11
12							12							12
13							13							13
14							14							14
15							15							15
16							16							16
17							17							17
18							18							18
19							19							19
20							20							20
21							21							21
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26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Total value (sum of daily value entries)

Type T Water year 1978

21 32

Mar Code 00010

TEMP MAX  
Preliminary Data  
Subject to Review

Remarks



Coding Form for Input and Update of Daily Values--Continued

00306033 Sorghum Gulch

Station identification number

Water year 1979

TEMP MAX

CARD NO.	DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1							1							1
	2							2							2
	3							3							3
	4							4							4
	5							5							5
	6							6							6
	7							7							7
	8							8							8
Card No. 02	9							9							9
	10							10							10
	11							11							11
	12							12							12
	13							13							13
	14							14							14
	15							15							15
	16							16							16
Card No. 03	17							17							17
	18							18							18
	19							19							19
	20							20							20
	21							21							21
	22							22							22
	23							23							23
	24							24							24
Card No. 04	25							25							25
	26							26							26
	27							27							27
	28							28							28
	29							29							29
	30							30							30
	31							31							31

TOTAL CHECK CARD

Type ☒ T

Water year 1979

Total value (sum of daily value entries)

21	20	32
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Stat Code 00010  
Stat Code 00001

Temp  
Preliminary Record  
Subject to Revision  
MAX

Remarks





# Coding Form for Input and Date of Daily Values--Continued

09306033 Sorghum Gulch

Station identification number

Water year

1979

TEMP MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
9							9							9
10							10							10
11							11							11
12							12							12
13							13							13
14							14							14
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16							16							16
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21							21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

Total value (sum of daily value entries)

21	22	23	24	25	26	27	28	29	30	31
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Type Water year

1	17	18	19	20
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TOTAL CHECK CARD

Stat Code 00010 Temp Preliminary Record  
Stat Code 00000 Subject to Revision

Remarks



Coding Form for Input a date of Daily Values--Continued

Station identification number 67206002 SANCTUARY OF THE BILBO Water year 1978 Temp mean

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1					No DATA		1
2							2					No DATA		2
3							3							3
4							4							4
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28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type T Water year 1978 20

Total value (sum of daily value entries) 21 32

Par Code 0010 Stat Code 0002

Temp mean

Preliminary Record Subject to Revision

Remarks

# Coding Form for Input and Update of Daily Values--Continued

09306033 Sorghum Gulch

Station identification number

Water year

1979

TEMP MEAN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
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28							28							28
29							29							29
30							30							30
31							31							31

Total value (sum of daily value entries)

21	22
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Type ☐ T ☐ 1

Water year 1979

TOTAL CHECK CARD

Par Code 00010 Temp  
Stat Code 00003 Preliminary Record  
Subject to Revision  
MEAN

Remarks



Coding Form for Input and State of Daily Values--Continued

Station Identification number 07204033

SOLGWIN RIVER STA 40000000

Water year 1978

COND MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1					NO DATA		1
2							2					NO DATA		2
3							3							3
4							4							4
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TOTAL CHECK CARD

Type T 1  
Water year 1978 17 20

Total value (sum of daily value entries)  
21 32

COND MAX  
Preliminary Record  
Subject to Revision  
Year Code 0001  
Bar Code 00095

Remarks



# Coding Form for Input at pdate of Daily Values--Continued

00006000 Sorghum Gulch

Station identification number

Water year

1979

CONO MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
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30							30							30
31							31							31

Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Type ☒ T Water year 1979

Total value (sum of daily value entries)

21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
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Preliminary Record  
Subject to Revision  
CONO MAX

Remarks

Coding Form for Input and Date of Daily Values--Continued

Station identification number 19306033

WASHIN GULCH NR RIO PIEDO

Water year 1978

COND MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1					No DATA		1
2							2					No DATA		2
3							3							3
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31							31							31

TOTAL CHECK CARD

Type T Water year 1978

Total value (sum of daily value entries) 21 32

Par Code 00005 Stat Code 00000

COND MIN

Remarks



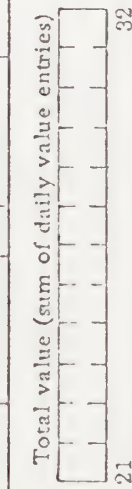
# Coding Form for Input and Update of Daily Values--Continued

Station identification number 00000003 Sorghum Gulch

Water year 1979

CONO MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
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3							3							3
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29							29							29
30							30							30
31							31							31



Type T Water year 1979

TOTAL CHECK CARD

War Code 00095 CONO  
 War Code 00002 Preliminary Record  
 War Code 00002 Subject to Revision  
 11/16

Remarks



# Coding Form for Input and Date of Daily Values--Continued

Station identification number

SARGHAM CULCH NE RICH PLEIN

1975

Water year

1975

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
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3							3							3
4							4							4
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30							30							30
31							31							31

TOTAL CHECK CARD

Type T 1

Water year 1975

Total value (sum of daily value entries) 21 32

NO CODE 000000

COND COND

Remarks

Coding Form for Input and update of Daily Values--Continued

Station Identification number 0000033 Sorghum Gulch Water year 1979 COND mean

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
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27							27							27
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29							29							29
30							30							30
31							31							31

Total value (sum of daily value entries)

21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
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Type T Water year 1979

TOTAL CHECK CARD

Per Code 00095 COND  
Data Code 00003 Preliminary Record  
Subject to Revision  
HIEBA

Remarks

USGS WATER GAUGING STATION 09306036  
Cottonwood Gulch Near Rio Blanco

A. DAILY TABLES

1. Gauge Height
2. Specific Conductance
3. Temperature





Daily Gage Height, in Feet, and Discharge, in Second-Feet, of San Juan River at San Juan

for the Year Ending September 30, 1927

Near San Juan

Drainage Area San Juan Square Miles. Water-Stage Recorder San Juan Gage Read to San Juan Once Twice a Day by San Juan

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION

Station San Juan  
File Number Washington  
District  
Used rating table dated 1901

Gage heights used to half tenths between hundredths below and tenths above these limits.

Date	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
1																								
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27																								
28																								
29																								
30																								
31																								
TOTAL																								
Mean																								
Second feet per square mile																								
Run-off in inches																								
Run-off in acre-feet																								
Maximum																								
Minimum																								

BRITISH RECORD  
OFFICE TO REVISION



# Coding Form for Input and Update of Daily Values--Continued

Station identification number **09306036**

**SOLAR-HUM**

Water year **1978**

**COND MAX**

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2					21.5		2
3							3					7.9		3
4							4							4
5							5							5
6		669999					6							6
7		999999					7							7
8							8							8
9							9							9
10							10							10
11							11							11
12							12							12
13							13							13
14							14							14
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16							16							16
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20							20							20
21							21							21
22							22							22
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27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

Par Code **COND** Preliminary Record  
 Stat Code **MAX** Subject to Revision

Total value (sum of daily value entries)

21	22	23	24	25	26	27	28	29	30	31

Type **T** Water year **1978**

TOTAL CHECK CARD

Remarks



Station id. 09306036 Sorghum Gulch at mouth

Water year 1979

CONDO 1979

Card No. 01		OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1								1							1
2								2							2
3								3							3
4								4							4
5								5							5
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7								7							7
8								8							8
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10								10							10
11								11							11
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19								19							19
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21								21							21
22								22							22
23								23							23
24								24							24
25								25							25
26								26							26
27								27							27
28								28							28
29								29							29
30								30							30
31								31							31

NO FLOW

TOTAL CHECK CARD

Type ☐ T ☐ 1 Water Year  17  20  32

Total value (sum of daily value entries)  21  32

Bar Code 00095 10000 Preliminary Record  
Stat Code 00001 00000 Subject to Revision

Remarks

# Coding Form for Input and Update of Daily Values--Continued

Station identification number 09306036

Water year 1978

COND MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1													1
2													2
3													3
4													4
5													5
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26													26
27													27
28													28
29													29
30													30
31													31

TOTAL CHECK CARD

Type T Water year 1978

Total value (sum of daily value entries) 21 32

Dec Code 2000 Preliminary Record  
 Water Code 0002 Subject to Revision  
 Subject to Revision

Remarks



COND min

1979

Water year

09305038 Sorghum Gulch at mouth

Station identification number

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
9							9							9
10							10							10
11							11							11
12							12							12
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14							14							14
15							15							15
16							16							16
17							17							17
18							18							18
19							19							19
20							20							20
21							21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Type ☐ T ☐ 1

Water year

Total value (sum of daily value entries)

Year Total

COND min

Subject to Revision

marks



# Coding Form for Input and Update of Daily Values--Continued

Station identification number **09306036**

Water year **1978**

COND **mean**

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1					112		1
2							2					75		2
3							3							3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
9							9							9
10							10							10
11							11							11
12							12							12
13							13							13
14							14							14
15							15							15
16							16							16
17							17							17
18							18							18
19							19							19
20							20							20
21							21							21
22							22							22
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25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type **T** 1 Water year **1978** 20

Total value (sum of daily value entries) 21 32

Par Code **0000** Stat Code **00003**

Preliminary Record  
Subject to Revision  
COND  
Preliminary Record  
Subject to Revision

Remarks





# Coding Form for Input and Update of Daily Values--Continued

Water year 1978

Station identification number 03306036

Location SONGUM CULCH AT MULLH

TEMP MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	999999	999999					1					No Data		1
2							2					No Data		2
3							3							3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
9							9							9
10							10							10
11							11							11
12							12							12
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14							14							14
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17							17							17
18							18							18
19							19							19
20							20							20
21							21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31	999999						31							31

Preliminary Record  
Subject to Revision  
Preliminary Record  
Subject to Revision

Par Code 00010  
Stat Code 00011

Total value (sum of daily value entries)  
21  
32

Type T Water year 1978

TOTAL CHECK CARD

Remarks



TEMP MAX

1979

Water year

09306035 Sorghum Gulch at mouth

Station identification number

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
9							9							9
10							10							10
11							11							11
12							12							12
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14							14							14
15							15							15
16							16							16
17							17							17
18							18							18
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26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Type ☐ T ☐ 1

Water year  17  20

Total value (sum of daily value entries)  21  32

TEMP MAX

PRELIMINARY PROCESSING

SUBJECT TO REVISIONS

Remarks

# Coding Form for Input and Update of Daily Values--Continued

Station identification number 09306036 Water year 1978

TEMP MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	999999	999999									8.0		1
2											10.7		2
3													3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15													15
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17													17
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26													26
27													27
28													28
29													29
30													30
31													31

TOTAL CHECK CARD  
 Type T Water year 1978  
 Total value (sum of daily value entries) 21  
 Par Code 00010 Stat Code 00000  
 Subject to Review -----  
 Subject to Review -----

Remarks



1979

TEMP

Water year

09306030 Scripps Gulch at ...

Station identifier cation number

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
9							9							9
10							10							10
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26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Type T 1

Water year 17 20

Total value (sum of daily value entries) 21 32

Max Col 00010  
Min Col 00000

Temp min

Preliminary Record  
Subject to Revision

Remarks



# Coding Form for Input and Update of Daily Values--Continued

Station identification number 09306036 Water year 1978 TEMP MEAN

Station identification number

CARD NO.	DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1	999999	999999											1
	2													2
	3													3
	4													4
	5													5
	6													6
	7													7
	8													8
Card No. 02	9													9
	10													10
	11													11
	12													12
	13													13
	14													14
	15													15
	16													16
Card No. 03	17													17
	18													18
	19													19
	20													20
	21													21
	22													22
	23													23
	24													24
Card No. 04	25													25
	26													26
	27													27
	28													28
	29													29
	30													30
	31	999999												31

TOTAL CHECK CARD

Type ☐ T ☐ 1

Water year 1978

Total value (sum of daily value entries)  
 21 32

Par Code 0010 Stat Code 0000  
 Preliminary Record  
 Subject to Revision

Remarks

Station identifier 09306020 cation number 09306020 Sorghum-Triticum Water year 1979 TEMP 1980

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
9							9							9
10							10							10
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16							16							16
17							17							17
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29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type ☐ T ☐ 1 17 20

Water year ☐ 17 ☐ 20

Total value (sum of daily value entries) ☐ 21 ☐ 32

Par Code 00010 temp

Stat Code 00000 no data

Preliminary Record  
Subject to Revision

marks

USGS WATER GAUGING STATION 09306039  
Cottonwood Gulch Near Rio Blanco

A. DAILY TABLES

1. Gauge Height
2. Specific Conductance
3. Temperature





UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION

COLO  
NK RIO BLANCO

File Number 09306039

Station 641.4 CH  
for the Year Ending September 30, 1979

Drainage Area Square Miles Water-Stage Recorder CONTINUOUS Ratio 1 : 6  
Gage Read to Once a Day by

Used rating table dated NO 1  
Gage height used to half tenths between, and feet  
hundredths below and tenths above these limits.

Date	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		DAY	
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	1	2
1																										
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30																										
31																										

TOTAL		Mean	Second foot	Runoff in inches	Runoff in acre	Maximum	Minimum
		square mile	foot	foot	foot		

For "a" - NO gage height recorded; "b" - ice effect  
S. DISCHARGE SUPPLEMENTED BY Y-VANALOG SHIFT DISCHARGE ESTIMATED  
Max Disch - Sec. ft. on (C. H. (N. Max C. H. (N. at 00  
Min Disch - Sec. ft. on (C. H. (N. Min C. H. (N. at 00



Coding Form for Input and Update of Daily Values--Continued

Station identification number

COTTONWOOD GULCH

07306037

Water year

1978

MAX CORR

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
9							9							9
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11							11							11
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16							16							16
17							17							17
18							18							18
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28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type

T

Water year

1 17 20

Total value (sum of daily value entries)

21 32

Preliminary  
Subject to

Par Code

Stat Code

Remarks



# Coding Form for Input and Update of Daily Values--Continued

06306039 Cottonwood Gulch

Station identification number

Water year 1979

Box 2

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
9							9							9
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27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Total value (sum of daily value entries)

Type T 1 17 20 32

Box Code 000000-COND  
Water Code 000000-MAK

Preliminary Record  
Subject to Revision

# Coding Form for Input and Date of Daily Values--Continued

Water year 1978

09306039

COTTONWOOD GULCH

MAIN COND

Station identification number

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
9							9							9
10							10							10
11							11							11
12							12							12
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14							14							14
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16							16							16
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21							21							21
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29							29							29
30							30							30
31							31							31

Total value (sum of daily value entries)

21 32

Water year

17 20

Type

1 T

TOTAL CHECK CARD

Preliminary Record

Subject to Revision

For Code 6666

COND. MAIN

Remarks

Preliminary Record

Subject to Revision



# Coding Form for Input and Update of Daily Values--Continued

10306039 Cottonwood Gulch

Station identification number

Water year 1979

MIN COND

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
9							9							9
10							10							10
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14							14							14
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16							16							16
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27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Type T 1  
Water year 1979  
Total value (sum of daily value entries) 21 32

COND

10306039 MIN COND  
Preliminary Record  
Subject to Revision

Remarks



# Coding Form for Input and Update of Daily Values--Continued

Station identification number		COTTONWOOD		GULCH		07306039		1978		Water year		1978		MAY (05)		JUNE (06)		JULY (07)		AUG (08)		SEPT (09)		DAY								
Card No. 01		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Card No. 02																																
Card No. 03																																
Card No. 04																																

**TOTAL CHECK CARD**

Type ☒ T ☐ 1

Water year  17  20

Total value (sum of daily value entries)  21

Par Code

Total Code

COLO

mem

Remarks





# Coding Form for Input and Update of Daily Values--Continued

Station identification number

COTTONWOOD GULCH

09306039

Water year

1978

MAX TEMP

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
5							5							5
6							6							6
7							7							7
8							8							8
9							9							9
10							10							10
11							11							11
12							12							12
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14							14							14
15							15							15
16							16							16
17							17							17
18							18							18
19							19							19
20							20							20
21							21							21
22							22							22
23							23							23
24							24							24
25							25							25
26							26							26
27							27							27
28							28							28
29							29							29
30							30							30
31							31							31

TOTAL CHECK CARD

Total value (sum of daily value entries)

Type ☒ T ☐ 1

Water year

21 20 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

Preliminary Record  
Subject to Revision

Final Code 0000  
Preliminary Code 0000  
TEMP 0000

Remarks



MAX TEMP

Coding Form for Input and Update of Daily Values--Continued

1979

Station identification number

Water year

DAY		OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
Card No. 01	1							1							
	2							2							
	3							3							
	4							4							
	5							5							
	6							6							
	7							7							
	8							8							
Card No. 02	9							9							
	10							10							
	11							11							
	12							12							
	13							13							
	14							14							
	15							15							
	16							16							
Card No. 03	17							17							
	18							18							
	19							19							
	20							20							
	21							21							
	22							22							
	23							23							
	24							24							
Card No. 04	25							25							
	26							26							
	27							27							
	28							28							
	29							29							
	30							30							
	31							31							

TOTAL CHECK CARD

Type ☐ T ☐ 1 Water year 1979 20

Total value (sum of daily value entries) 21 32

Per Code 00010.0 MAX  
Stat Code 00000.0 MAX

Remarks





# 03306039 Cottonwood Gulch

Coding Form for Input and Update of Daily Values--Continued

11113 T-11P

Station identification number

Water year 1979

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)
1							1						
2							2						
3							3						
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31							31						

TOTAL CHECK CARD

Type ☒ T ☐ 1

Water year 1979

Total value (sum of daily value entries) 21 32

Preliminary Report  
Subject: T-11P  
Station: 03306039  
Date: 000000000000 min

Remarks



# Coding Form for Input and Update of Daily Values--Continued

Station identification number

COTTONWOOD GULCH

09306039

Water year 1978

MISSOURI TRIP

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
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TOTAL CHECK CARD

Type

T

Water year

17 20

Total value (sum of daily value entries)

21 32

Preliminary Record Subject to Revision

Par Code 00010

Stat Code 00010

Temp mean 00010

Remarks

McFarland

157

Total value (sum of daily value entries)

TOTAL CHECK CARD

Type	Water year
T	1979
I	1720

Total value (sum of daily value entries)	21	32
--	----	----

Date Filed 00010 Temp  
 Document Code 01002  
 Subject to Revision  
 "Official" Record

USGS WATER GAUGING STATION 09306042  
Cottonwood Gulch Near Rio Blanco

A. DAILY TABLES

1. Gauge Height
2. Specific Conductance
3. Temperature



LICENSED Charles H. H. H.  
 NEAR Rio Blanco  
 DEPARTMENT OF THE INTERIOR  
 GEOLOGICAL SURVEY  
 WATER RESOURCES DIVISION  
 for the Year Ending September 30, 1972.  
 Rio Blanco, Colorado  
 Square Miles. Water-Sage Reometer CONTINENTAL  
 Rule 1 : 6  
 Gauge Read to Twice Once a Day by Twice  
 Gauge height used to half inches between hundredths below and tenths above these limits.

Discharge Area		OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		TOTAL		Minimum		Maximum	
Day	Hour	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Feet	Second feet per square mile	Run off in inches	Run off in acre feet	Minimum	Maximum
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2 1977-78 July 1977

Daily Gage Height, in Feet, and Discharge, in Second-Foot, of PICERANCE CREEK TRIBUTARY <sup>at</sup> CLARK

at Rio Blanco, Col. GRAD for the Year Ending September 30, 1977

Drainage Area Square Miles, Water-Stage Recorder CONTINUOUS Ratio 1:6

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION

MR. RIO BLANCO, Colo.

File Number 1

Used rating table dated NOV 1

Gage Read to Once a Day by Table and once a day  
Gage heights used in half-feet between hundredths below and tenths above these limits

Day	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge		
1																								
2																								
3																								
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31																								
TOTAL																								
Mean																								
Second feet per square mile																								
Run-off in inches																								
Run-off in acre feet																								
Maximum																								
Minimum																								

RECORD  
RECORD  
RECORD

5- DISCHARGE SUB DIVIDED, VARIATION, ICE EFFECT, X-OBSERVATION  
FAR ALL-NO GAGE HEIGHT RECORD, b" ICE EFFECT, X-OBSERVATION



Coding Form for Input and Update of Daily Values--Continued

1978

Water year

1978

Station Identification number

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DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
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30							30							30
31							31							31

Total value (sum of daily value entries)

Type ☐ T ☐ 1

Water Year 17 20

Par Code 000000

Stat Code 000000

Remarks



# Coding Form for Input a. pdate of Daily Values--Continued

Station identification number 04306042 Piceance Cr. Trib.

Water year 1979

COND MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
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30							30							30
31							31							31

TOTAL CHECK CARD

Type

T 1

Water year

1979 17 20

Total value (sum of daily value entries)

21

Year Code 00095 S.C.  
Stat Code 00001 Max  
Preliminary Record  
Subject to Revision

Remarks

# Coding Form for Input ar date of Daily Values--Continued

Station Identification number 7301042

PULPICE CR TALS HP RIO ALPICO

Water year 1978

COND MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
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30							30							30
31							31							31

Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Type ☒ T

Water year  17  20

Total value (sum of daily value entries)  21  32

Far Code 0000  
What Code 0000

Subject to Review  
Preliminary Record  
Cond. min

Remarks



# 09306042 Piceance Cr. Trib. Coding Form for Input and date of Daily Values--Continued

Station identification number

Water year 1979

COND MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
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30							30							30
31							31							31

TOTAL CHECK CARD

Total value (sum of daily value entries)

21																			
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Type	Water year
T	1979
1	17
	20

Bar Code 00095 S.C.  
Preliminary Record  
Subject to Revision

Remarks



Coding Form for Input and Date of Daily Values--Continued

Station Identification number 047

PROJECT OF TWR NO FLOW Water year 1978

COND MEAN

DAY		OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1								1							1
2								2							2
3								3							3
4								4							4
5								5							5
6								6							6
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30								30							30
31								31							31

NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

Total value (sum of daily value entries)

Type ☒ T ☐ 1

TOTAL CHECK CARD

Water year  17  20  32

COND. MEAN

par Code 0000

Remarks

Subject to Revision

Station Record

09306042 Piceance Cr. Trib. Ceding Form for Input Update of Daily Values--Continued

Station identification number

Water year

1979

CONO MEAN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
3							3							3
4							4							4
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31							31							31

NO FLOW

TOTAL CHECK CARD

Type T 1

Water year 1979 20

Total value (sum of daily value entries) 21

Preliminary Record Subject to Revision

Par Code 00095 J.C.  
Stat Code 00002 MIN

Remarks









# Coding Form for Input and Update of Daily Values--Continued

Station identification number

0000000000

Water year 1978

TEMP 1978

CARD No. 01	CARD No. 02	CARD No. 03	CARD No. 04	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31

Total value (sum of daily value entries)

20 2022 10000

Preliminary Record  
Subject to Revision

Type T 1

Water year 17 20

Remarks







### Coding Form for Input and Update of Daily Values--Continued

Temp. 22.00

Water year 1978

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117

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二

difficult to

## Section 1

PAY	OCT (00)	NOV (01)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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31							31							31

Page Code 10010  
Page Code 10010

Total value (sum of daily value entries)	
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Type	Water year	
T		17
1		20

TOTAL CHECK CARD

Remarks

UAD311  
JAN 1961  
Primary Record  
Subject to Revision

# 99306042 Piceance Cr. 1115. Coding Form for Input and update of Daily Values--Continued

Station identification number

Water year 1979

TEMP MEAN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
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31							31							31

NO FLOW

TOTAL CHECK CARD

Type T Water year 1979

Total value (sum of daily value entries)  
21

Preliminary Record  
Subject to Revision

Par Code 00010 TEMP  
Stat Code 00003 MEAN

Remarks

USGS WATER GAUGING STATION 09306050  
Cottonwood Gulch Near Rio Blanco

A. DAILY TABLES

1. Gauge Height
2. Specific Conductance
3. Temperature













Station identification number

09306050 Standard Form for Input at

date of Daily Values--Continued

Water year 1979

COND MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
2							2							2
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Total value (sum of daily value entries)

21

Type 1

Water year 1979

TOTAL CHECK CARD

1

Preliminary Record  
Subject to Revision

Par Code 00095 COND  
Est Code 00001 MAY

Remarks

# Coding Form for Input and Date of Daily Values--Continued

Station identification number 0226050 SEPMOND GULL CREEK PR SDO APR 1978 COND MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
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31							31							31

TOTAL CHECK CARD

Type ☐ T ☐ 1 Water year 1978 20 21 32

Total value (sum of daily value entries) 21 20 32

Par Code 000000 Stat Code 000000

Preliminary Record  
Subject to Revision COND min.

Remarks



# 09306050 Scandard Gulch

Coding Form for Input at

date of Daily Values--Continued

Station identification number

Water year

1979

Water year

1979

COND MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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TOTAL CHECK CARD

Type

T 1

Water year

1979

Total value (sum of daily value entries)

21

Preliminary Record  
Subject to Revision

Card Code 00095 Cond  
Stat Code 00003 MIN

Remarks



Coding Form for Input and Date of Daily Values--Continued

Station identification number

00306050

Water year 1978

COND MEAN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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TOTAL CHECK CARD

Total value (sum of daily value entries)

Par Code

Stat-Code

COND. MEAN

Preliminary Record Subject to

COND. MEAN

Remarks





# Coding Form for Input and Date of Daily Values--Continued

Station identification number		Water year		TEMP MAX										
00206050		1975		TEMP MAX										
SECOND EPOCH IN RAIN GAGE														
DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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Total value (sum of daily value entries)

21	22	23	24	25	26	27	28	29	30	31

Water year

1	2	3	4	5	6	7	8	9	0
1	9	7	8						

TEMP MAX



# 02306050 Standard Gauge Form for Input and Update of Daily Values--Continued

Station identification number

Water year 1977

TEMP MAX

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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TOTAL CHECK CARD

Total value (sum of daily value entries)

21

Type T 1 Water year 1977 20

Preliminary Record  
Subject to Revision

PAR Code 00010 Temp  
State No 00001 max

Remarks

# Coding Form for Input at State of Daily Values--Continued

Station identification number 07-06-050

Water year 1978

SECOND CHECK FOR NO FLOW

TEMP ...IN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
1							1							1
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NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

NO FLOW

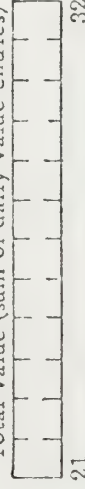
NO FLOW

NO FLOW

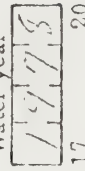
NO FLOW

NO DATA

Total value (sum of daily value entries)



Water year 1978



TOTAL CHECK CARD

Type T

Temp min

NO FLOW

Remarks







# Coding Form for Input and State of Daily Values--Continued

Station identification number 09206050 SCANDINAVIAN GULCH AIR RIO DELFINO Water year 1978 TEMP MEAN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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TOTAL CHECK CARD

Type ☒ T ☐ 1

Water year     20

Temp  32

Remarks

09306050 Standard Gulch

Station identification number

Water year 1911

TEMP 11:50 PM

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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TOTAL CHECK CARD

Type	Water year
T	1979

Total value (sum of daily value entries)
Predicted

Preliminary Record  
Subject to Revision

Run Code	00010	Temp
Run Code	00003	mean

Remarks

USGS WATER GAUGING STATION 09306052  
Cottonwood Gulch Near Rio Blanco

A. DAILY TABLES

1. Gauge Height
2. Specific Conductance
3. Temperature



1928

July 1st  
Daily Gage Height, in Feet, and Discharge, in Second-Feet, of SAN JUAN GULCH AT MOUTH  
Near BLANCO, COLORADO for the Year Ending September 30, 1928.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION

AT MOUTH  
NEAR RID BLANKO,  
COLO

09306052

Used rating table dated No. 1

Gage heights used to half-ticks between hundredths below and ticks above these figures.

Gage Read to  
Once  
Twice a Day by

Square Miles. Water-Stage Recorder  
CONTINUOUS

Drainage Area

Date	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		Total		Calendar Year	
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Min.	Max.	Min. Disch.	Max. Disch.
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Calendar Year																												
Min. Disch.																												
Max. Disch.																												

Preliminary Record  
Subject to Revision





# Coding Form for Input and Update of Daily Values--Continued

Station identification number 09306052

REPORTED ANCHOR CAPTURE IN 210 210000

Water year 1978

NOV 0 1978

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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TOTAL CHECK CARD

Type ☒ T ☐ 1  
Water year 1978 20  
17

Total value (sum of daily value entries) 21  
32 Stat Code 00001

Tag Code 00000

Preliminary Report  
Subject to Revision  
NOV 0 1978

Remarks



Preliminary Acc  
Subject to Revision  
COND MAY

Coding Form for Input and Update of Daily Values--Continued  
Standard Gulch at mouth

1979

Water year

09306052

Station identification number

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Type T 1  
Water year 1979 20

Total value (sum of daily value entries)  
21 32

Par Code 60003 COND  
State Code 00001 MAY

Remarks

# Coding Form for Input and Update of Daily Values--Continued

Station identification number 0906052

Water year 1978

COND MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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TOTAL CHECK CARD

Total value (sum of daily value entries)

Par Code 22093

Stat Code 0002

Type T Water year 1978

Preliminary Report  
Subject to Revision

Remarks



# Coding Form for Input and Update of Daily Values--Continued

Preliminary Record  
Subject to Revision

Water year 1979

Station identification number 09306052 Standard Gauge at mouth

Card No. 01

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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Per Code COND  
State Code MIN

Total value (sum of daily value entries)

Type T  
Water year 1979

TOTAL CHECK CARD

Remarks



# Coding Form for Input at DATE OF DAILY VALUES--Continued

Station identification number 00256052

WATER YEAR 1978

Water year 1978

1978

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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Type ☐ T ☐ 1  
 Water year 1978

TOTAL CHECK CARD

Par Code 2000  
 Stat Code 50003

Preliminary Record 0000  
 Subject to Review 0000

Remarks

# Coding Form for Input and Update of Daily Values--Continued

09306052 Standard Guich at mouth

Water year 1979

Preliminary No. 4  
Subject to Revision  
END man

Station identification number

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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Total value (sum of daily value entries)



TOTAL CHECK CARD

Type ☒ T 1  
Water year 1979

Par Code 00005 COND

Preliminary Record  
Subject to Revision

Stat Code 00003

Remarks



## Coding Form for Input and Update of Daily Values--Continued

Station identification number  
7501052

Summo bene omnium deus

Water year 1978

2003-04

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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TOTAL CHECK CARD

Total value (sum of daily value entries)

Type	Water year
1	1999
2	2000
3	2001
4	2002
5	2003
6	2004
7	2005
8	2006
9	2007
10	2008
11	2009
12	2010
13	2011
14	2012
15	2013
16	2014
17	2015
18	2016
19	2017
20	2018
21	2019
22	2020
23	2021
24	2022
25	2023
26	2024
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112	2110
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160	2158
16	

Par Code CC010

32 Stat. Code 0001

Preliminary Record  
Subject to Revision  
TEMP  
MAY

Remarks



# Coding Form for Input and Update of Daily Values--Continued

Station identification number 09306052 Standard Gulch at mouth Water year 1979 Preliminary Record Subject to Revision Temp MAX

Station identification number

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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TOTAL CHECK CARD

Type T Water year 1979 17 20

Par Code 00012 temp  
Stat Code 00001 MAX

Remarks

# Coding Form for Input and Update of Daily Values--Continued

Station identification number 07206052

20th. 2000 GALLON CONTAINER FOR FLUORO

Water year 1978

TEMP MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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TOTAL CHECK CARD

Type T Water year 1978

Total value (sum of daily value entries) 21 32

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temp min  
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1000000

Remarks



# Coding Form for Input and Update of Daily Values--Continued

Preliminary Record  
Subject to Revision

09306052 Standard Gulch at mouth  
Water year 1979

Station identification number

TEMP MIN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	DAY	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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TOTAL CHECK CARD

Type

T

Water year

1979

Total value (sum of daily value entries)

21 32

Max Value 0001.94 temp

Stat Code 0000 min

Remarks



# Coding Form for Input and Date of Daily Values--Continued

Station identification number 01306052

WATER NO FLOW

Water year 1978

TEMP MEAN

DAY	OCT (10)	NOV (11)	DEC (12)	JAN (01)	FEB (02)	MAR (03)	APR (04)	MAY (05)	JUNE (06)	JULY (07)	AUG (08)	SEPT (09)	DAY
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Card No. 01

Card No. 02

Card No. 03

Card No. 04

TOTAL CHECK CARD

Type ☒ T ☐ 1

Water year  17  20

Total value (sum of daily value entries)

21	32
----	----

Form Code 0010

Water Code 00003

Produced by NOAA  
Subject to TEMP  
mean

Remarks



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### Precipitation Data

The Precipitation data collection period, managed by the U. S. Geologic Survey, ended in October 1976. Until that point, data was collected at 5 of the 13 Water Gauging Stations on and about Tract C-b. The reader should also see Section II B-1, Air Quality for discussion of precipitation from Station 020 and 023.



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SPRINGS AND SEEPS

SEDIMENTS





### Sediment Analysis

An in-depth analysis of water samples was completed and reported in Quarterly Report #9.

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II A-2SPRINGS AND SEEPS

Water quality data were collected at six springs around the tract. These were S-1, S-3, S-6, S-7, S-9, and S-10. Refer to Figure II A-2 for the location of these springs. Table II A-2 summarizes the data.

<u>Table/Figure No.</u>	<u>Description</u>	<u>Page No.</u>
Figure II A-2	Springs & Seeps	II A-303
Table II A-2	Water Quality Parameters - Springs & Seeps (4 Pages)	II A-304

See Section IV for Station four-digit computer code.

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SPRINGS AND SEEPS AROUND  
Cb TRACT

Figure II A-2

CB-TRACT  
WATER QUALITY PARAMETERS  
SPRINGS & SEEPS  
FOR SAMPLE DATA SHOWN

SPG.	YR	MO	SPEC COND (UMHOS)	PH	TOT ALK (MG/L CACO <sub>3</sub> )	HARDNESS (MG/L CACO <sub>3</sub> )	SOLUBLE SOLIDS (MG/L)	CHEM O <sub>2</sub> DEMAND (MG/L)	BOD <sub>5</sub> (MG/L)	OIL AND GREASE (MG/L)	DISS O <sub>2</sub> (MG/L)	WATER TEMP (C)
WS02	78	6	1200.0	8.1	430.0	560.0	1000.0	.9	.9	.9	6.1	15.0
WS03	78	4	1350.0	8.3	440.0	540.0	960.0	16.0	22.0	10.0	9.4	17.0
		6	1250.0	8.0	400.0	430.0	750.0	.9	.9	9.0	8.6	16.0
		7		8.2	460.0	550.0	4800.0	20.0	30.0	3.0	7.5	15.5
WS04	78	6	1200.0	8.2	360.0	500.0	890.0	.9	.9	.9	7.5	15.0
WS06	78	6	1380.0	7.7	530.0	600.0	1100.0	.9	.9	.9	4.2	12.0
WS07	78	4	1400.0	7.9	500.0	640.0	1000.0	12.0	23.0	2.0	8.3	16.0
		7		7.7	510.0	610.0	4900.0	.9	30.0	3.0	5.5	12.0
WS08	78	7	1320.0	7.4	480.0	570.0	4400.0	.9	10.0	.9	6.2	15.0
WS09	78	6	1350.0	7.8	480.0	440.0	1000.0	16.0	10.0	.9	7.0	16.0
WS10	78	6	1250.0	7.9	463.0	360.0	710.0	28.0	57.0	13.0	11.2	14.0

NOTE: -.1 INDICATES NOT SAMPLED

REFER TO TABLE IV A-1 FOR LOCATION CODES



CB-TRACT  
WATER QUALITY PARAMETERS  
SPRINGS & SEEPS  
FOR SAMPLE DATE SHOWN

SPG.	YR	MO	MG (MG/L)	NO <sub>3</sub> (MG/L)	K (MG/L)	NA (MG/L)	SO <sub>4</sub> (MG/L)	HCO <sub>3</sub> (MG/L) CACO <sub>3</sub>	CA (MG/L)	CO <sub>3</sub> (MG/L) CACO <sub>3</sub>	CL (MG/L)	LI (MG/L)	AL (MG/L)	AS (MG/L)	BA (MG/L)
WS02	78	6	65.0	4.40	2.2	130.0	320.0	420.0	82.0	10.0	8.0	.02	.300	.010	.40
WS03	78	4	76.0	4.00	2.0	140.0	320.0	440.0	85.0	.9	8.0	.01	.050	.010	.40
		6	56.0	4.40	.6	120.0	430.0	370.0	72.0	30.0	6.0	.02	.300	.010	.40
		7	65.0	3.80	2.4	130.0	400.0	430.0	80.0	30.0	8.0	.02	.100	.010	.40
WS04	78	6	57.0	3.80	.8	120.0	390.0	340.0	76.0	20.0	6.0	.02	.100	.010	.40
WS06	78	6	92.0	3.80	2.5	150.0	320.0	500.0	84.0	30.0	11.0	.02	.300	.010	.50
WS07	78	4	88.0	2.00	2.0	140.0	320.0	500.0	100.0	.9	11.0	.02	.040	.010	.40
		7	70.0	1.80	2.1	130.0	330.0	460.0	110.0	50.0	11.0	.02	.100	.010	.50
WS08	78	7	62.0	3.10	2.2	140.0	300.0	310.0	92.0	170.0	11.0	.02	.200	.010	.50
WS09	78	6	87.0	4.20	1.3	130.0	310.0	480.0	93.0	.9	10.0	.02	.400	.010	.40
WS10	78	6	13.0	4.00	1.3	120.0	380.0	459.0	89.0	4.0	8.0	.01	.100	.010	.40

NOTE: -.1 INDICATES NOT SAMPLED

REFER TO TABLE IV A-1 FOR LOCATION CODES



CB-TRACT  
WATER QUALITY PARAMETERS  
SPRINGS & SEEPS  
FOR SAMPLE DATE SHOWN

SPG.	YR	MO	B	CD	CR	CU	F	FE	PB	MN	NI	ZN	SR	AG	MO
			(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)
WS02	78	6	.04	.010	.010	.090	.20	.40	.010	.090	.030	.090	5.0	.200	.010
WS03	78	4	.04	.020	.010	.010	.40	.03	.090	.020	.010	.030	3.0	.040	.010
		6	.04	.010	.010	.090	.20	.40	.010	.090	.200	.090	5.0	.100	.010
		7	.04	.010	.010	.090	.30	.40	.010	.090	.010	.090	5.0	.040	.010
WS04	78	6	.20	.010	.010	.090	.20	.40	.010	.090	.010	.090	5.0	.100	.010
WS06	78	6	.09	.010	.010	.090	.49	.40	.010	.090	.010	.090	6.0	.010	.010
WS07	78	4	.03	.100	.010	.010	.53	.02	.100	.070	.010	.020	6.0	.040	.010
		7	.04	.010	.010	.090	.41	.40	.010	.090	.020	.090	6.0	.100	.010
WS08	78	7	.04	.010	.010	.090	.45	.40	.010	.090	.100	.100	6.0	.040	.010
WS09	78	6	.03	.010	.010	.090	.40	.40	.010	.090	.010	.090	6.0	.010	.010
WS10	78	6	.10	.010	.010	.090	.40	.40	.090	.090	.010	.090	5.0	.010	.010

NOTE: -.1 INDICATES NOT SAMPLED

REFER TO TABLE IV A-1 FOR LOCATION CODES

CB-TRACT  
WATER QUALITY PARAMETERS  
SPRINGS & SEEPS  
FOR SAMPLE DATE SHOWN

SPG.	YR	MO	PHEN (MG/L)	NH3 (MG/L)	BR (MG/L)
WS02	78	6	.0430	.500	.090
WS03	78	4	.0070	.120	.300
		6	.0010	.300	.600
		7	.0100	.350	.400
WS04	78	6	.0100	.360	.500
WS06	78	6	.0030	.030	.800
WS07	78	4	.0040	.280	.400
		7	.0100	1.200	.400
WS08	78	7	.0020	.640	.700
WS09	78	6	.0050	.030	.100
WS10	78	6	.0080	.030	.400

NOTE: -.1 INDICATES NOT SAMPLED

REFER TO TABLE IV A-1 FOR LOCATION CODES

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## II A-3      GROUND WATER

Water quality data were collected in the first three quarters of 1978. Level data were collected at all alluvial wells (shown on Figure II A-3 ) that had water in them and at the deep monitoring wells indicated on Figure II A-4. Water level data are reported in Tables II A-3 through II A-5.

<u>Tables/Figure No.</u>	<u>Description</u>	<u>Page No.</u>
Figure II A-3	Alluvial Aquifer Monitoring Network With Proposed New Alluvial Wells	II A-311
Table II A-3	Water Levels - Alluvial Wells	
	a. Water Level Table	II A-313
	b. Water Level Plots (12 Pages)	II A-314
Figure II A-4	Deep Well Monitoring Network	II A-326
Table II A-4	Water Levels - Upper Aquifer Wells	
	a. Water Level Table	II A-328
	b. Water Level Plots (11 Pages)	II A-329
Table II A-5	Water Level - Lower Aquifer Wells	
	a. Water Level Table	II A-341
	b. Water Level Plots (10 Pages)	II A-342

See Section IV for four-digit Station computer code.



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ALLUVIAL AQUIFER MONITORING NETWORK WITH PROPOSED NEW ALLUVIAL WELLS  
A-2A, A-3A, A-5A, A-6A, A-7A

Figure II A-3

## Water Levels in Alluvial Wells

- A. Water Level Table
- B. Water Level Plots



TABLE II A-3

CB - TRACT  
WATER LEVELS IN ALLUVIAL WELLS  
FOR SAMPLE DATE SHOWN

WELL ID	WA01	WA02	WA03	WA04	WA05	WA06	WA07	WA08	WA09	WA10	WA11	WA12	WA13
GROUND LEVEL													
ELEV. (FT)	6279.0	6281.0	6447.0		6343.0	6358.0	6382.0	6406.0	6538.0	6608.0	6502.0	6690.0	
M.P. ELEV. (FT)	6282.2	6284.5	6448.6		6345.0	6360.0	6383.8	6409.0	6540.2	6610.6	6503.8	6691.8	
YR	MO.	Depth (FT)	Depth (FT)	Depth (FT)	Depth (FT)	Depth (FT)	Depth (FT)	Depth (FT)	Depth (FT)	Depth (FT)	Depth (FT)	Depth (FT)	Depth (FT)
77	9	6236.1	-3.0	6370.5	-2.0	6325.3	6327.4	6327.4	6490.4	6557.0	6449.3	6636.5	-2.0
	10	6238.0	-3.0	6367.8	-2.0	6325.4	6325.0	6346.9	6490.8	6557.5	6449.4	6636.5	-2.0
	11		-3.0	6367.1	-2.0	6326.4	6325.8	6347.0					-2.0
	12	6235.8	-3.0	6365.5	-2.0	6326.6	6326.8	6346.5	6490.9	6562.1	6449.1	6636.1	-2.0
78	1		-3.0	6365.0	-2.0	6326.4	6324.9	6345.7			6449.3		-2.0
	2		-3.0	6365.0	-2.0	6326.4	6324.9	6345.7			6449.3		-2.0
	3	6234.7	-3.0	6364.6	-2.0	6326.6	6323.9	6344.2	6490.7	6562.6	6449.3	6636.5	-2.0
	4	6234.4	-3.0	6364.9	-2.0	6326.4	6323.9	6344.0	6490.3	6564.3	6449.5	6637.0	-2.0
	5	6238.1	-3.0	6365.2	-2.0	6325.4	6323.0	6345.0	6490.09	6563.4	6447.4	6637.0	
	6	6239.1		6366.4		6327.2	6331.8	6351.4	6492.5	6563.3	6448.7	6637.69	
	7	6237.8	-3.0	6369.5	-2.0	6328.0		6352.9	6495.35	6558.84	6448.75	6636.3	
	8	6238.0		6369.6		6327.0	6327.25		6490.2	6557.1	6448.6	6635.9	
	9	6238.22	-3.0	6369.6	-2.0	6327.4	6331.2	6351.1	6490.25	6556.54	6448.55	6636.72	
	10	6237.11	-3.0	6371.94	-2.0	6326.34	6333.06	-3.0	6489.6	6555.94	6448.09	6634.51	
	11	6238.1	-3.0	6367.35	-2.0	6326.75	6325.57	-3.0	6489.6	6556.69	6448.	6634.32	

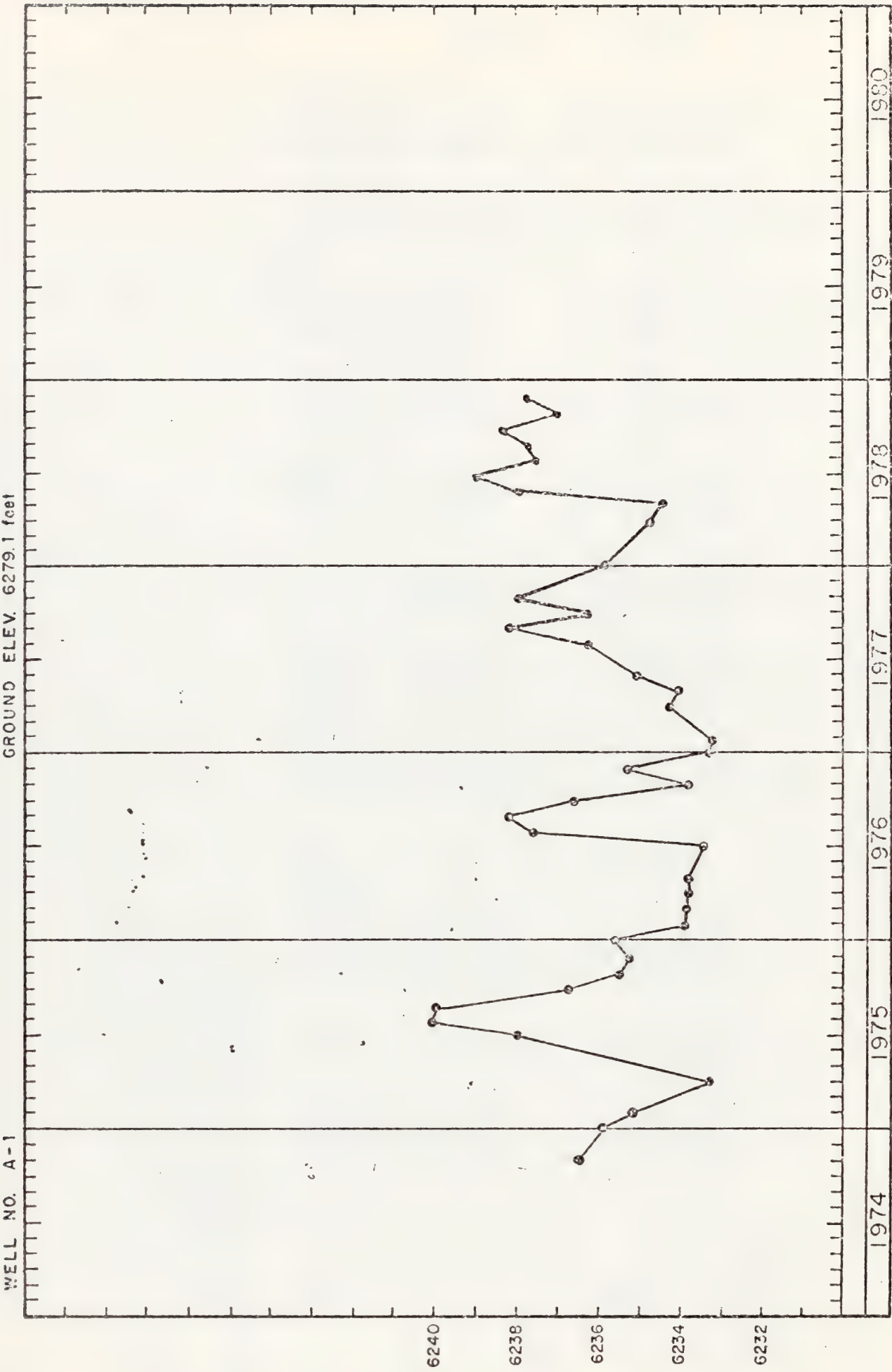
NOTE: -1.0 INDICATES WELL IS FLOWING  
 -2.0 INDICATES WELL IS DRY  
 -3.0 INDICATES WELL IS PLUGGED

REFER TO TABLE IV A-1 FOR LOCATION CODES

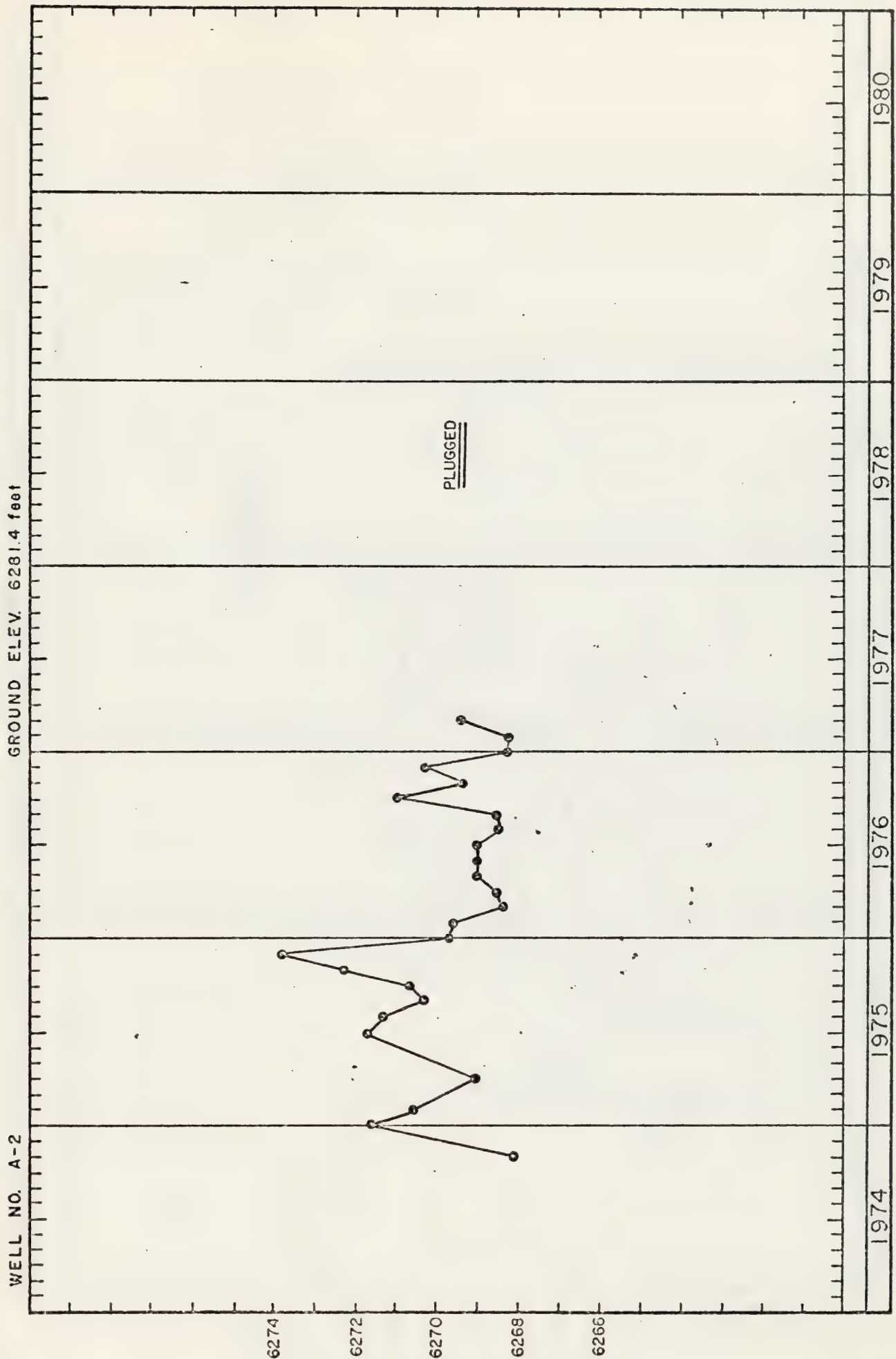
GROUND ELEV. 6279.1 feet

WELL NO. A-1

WATER LEVEL ELEVATION (FEET)

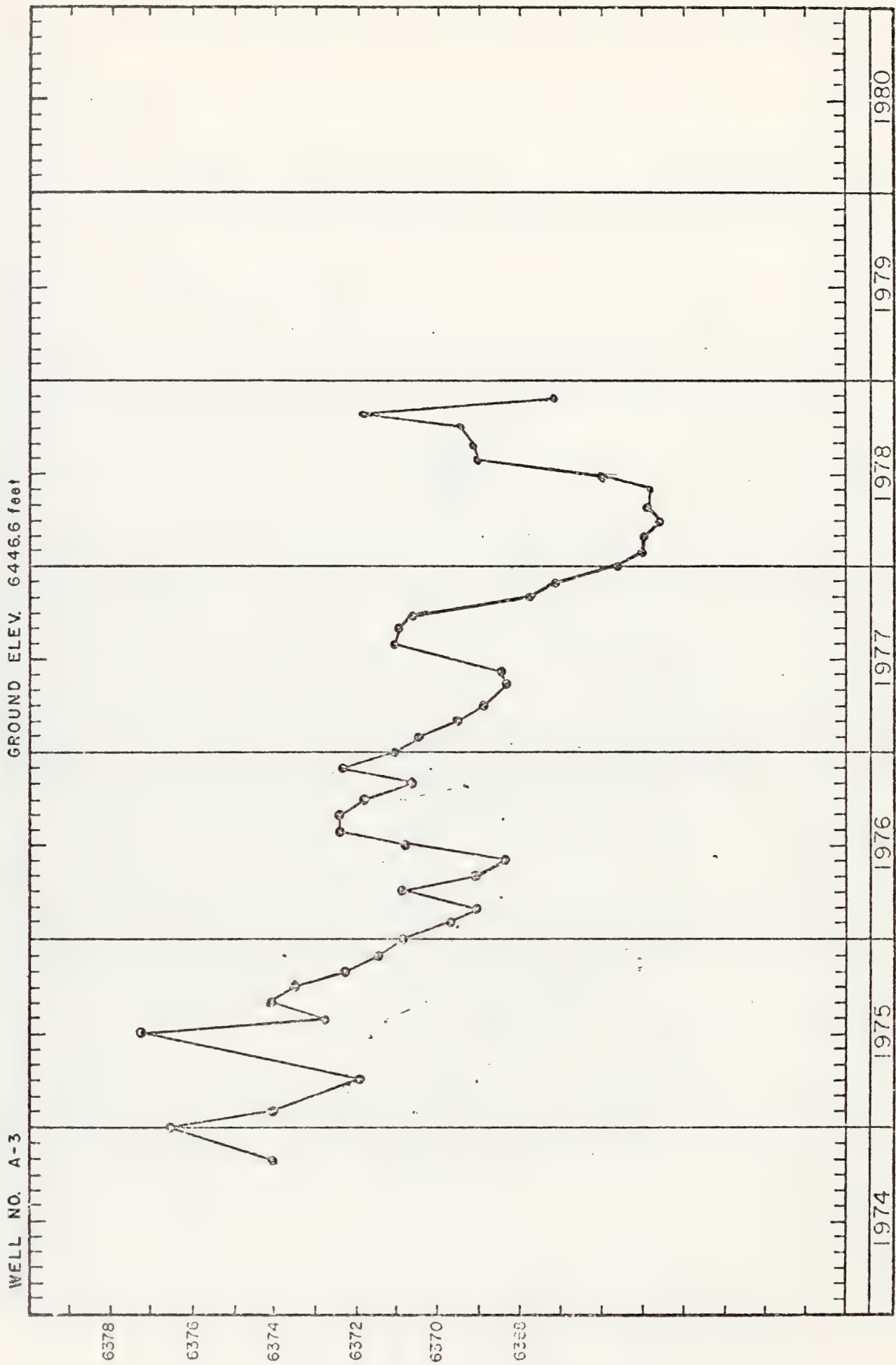


WATER LEVEL DATA



WATER LEVEL DATA





WATER LEVEL DATA

WELL NO. A-4

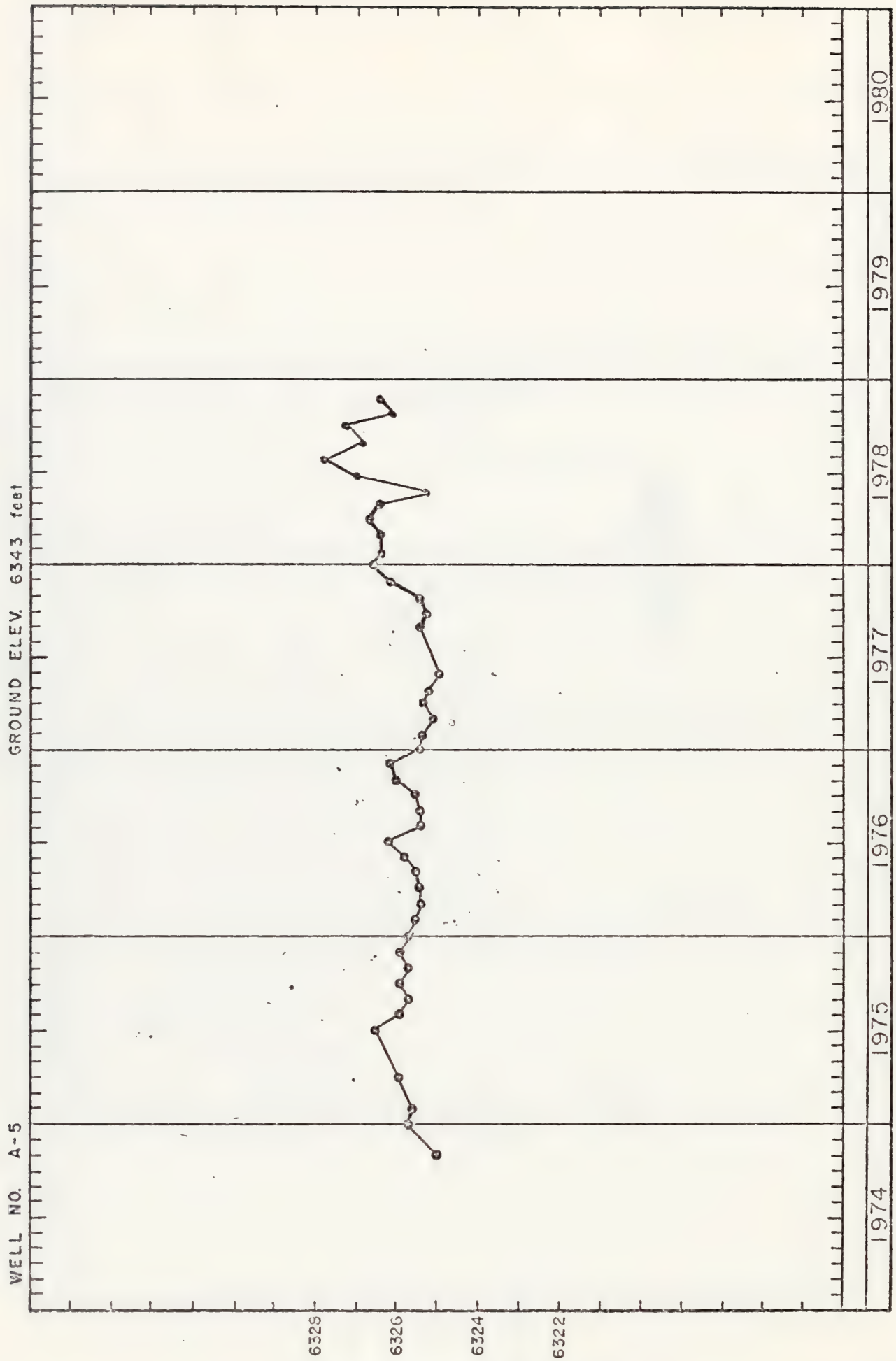
GROUND ELEV.

WELL IS DRY

1974	1975	1976	1977	1978	1979	1980

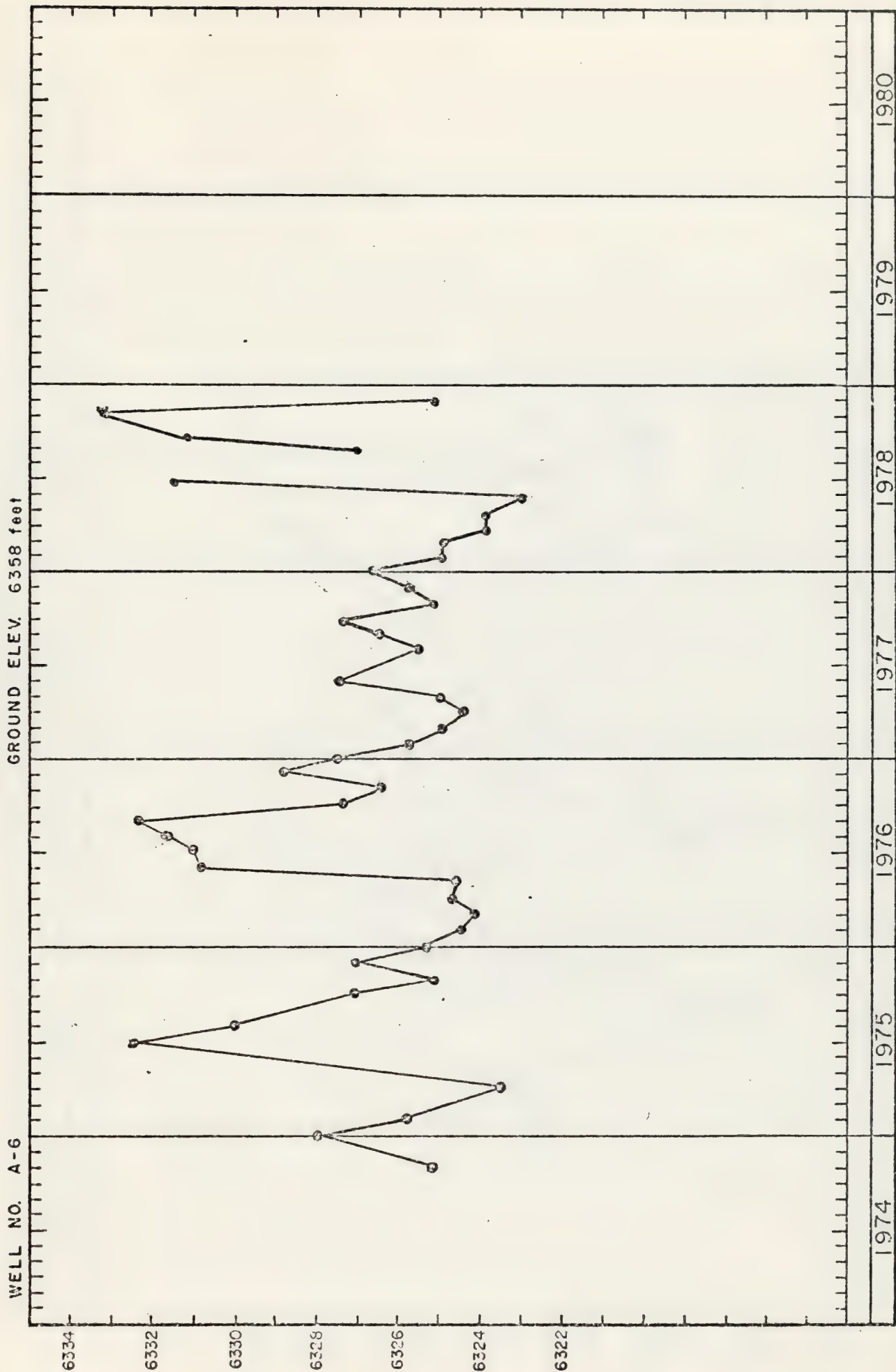
WATER LEVEL DATA

WATER LEVEL ELEVATION (FEET)

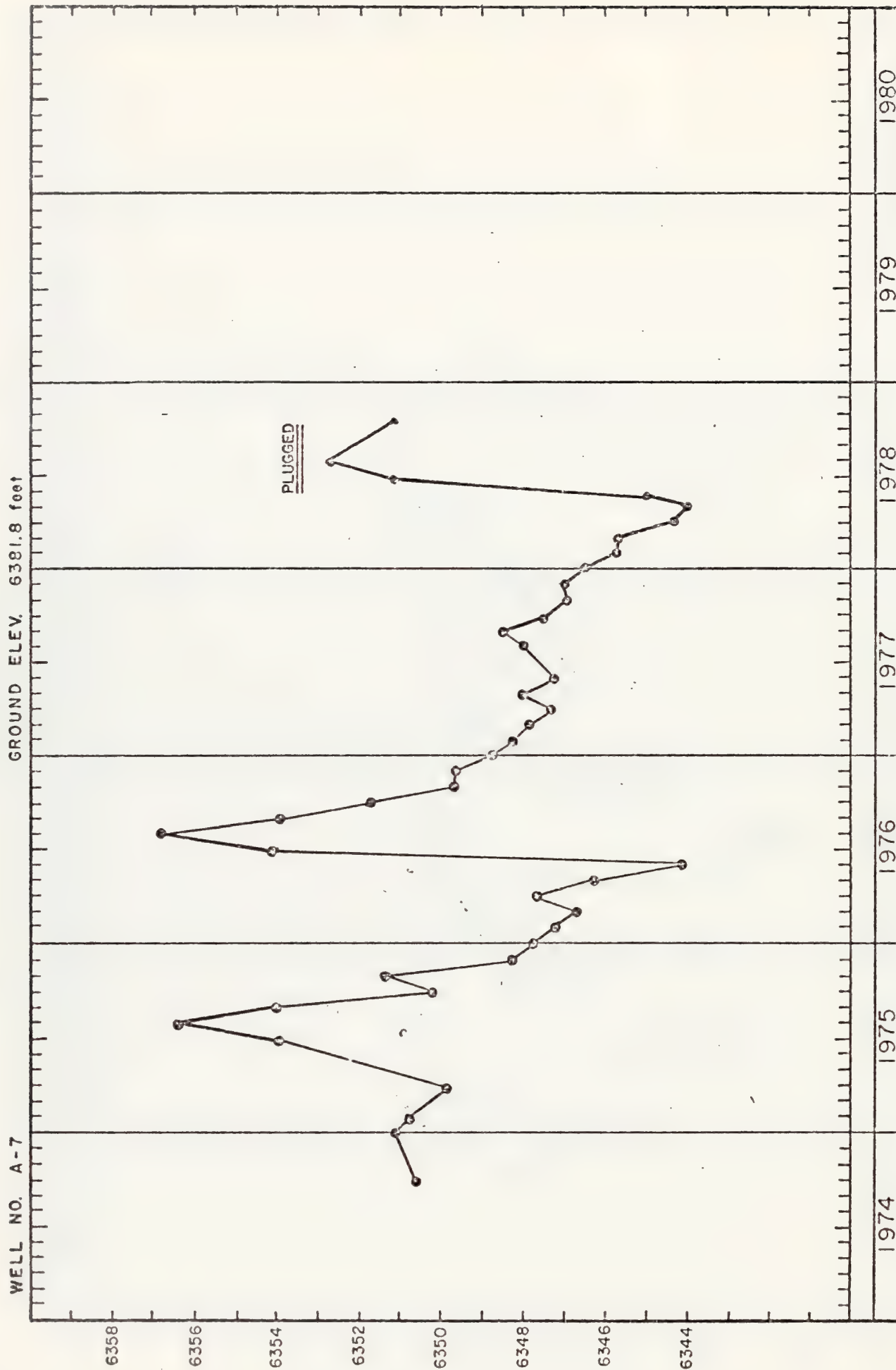


WATER LEVEL DATA

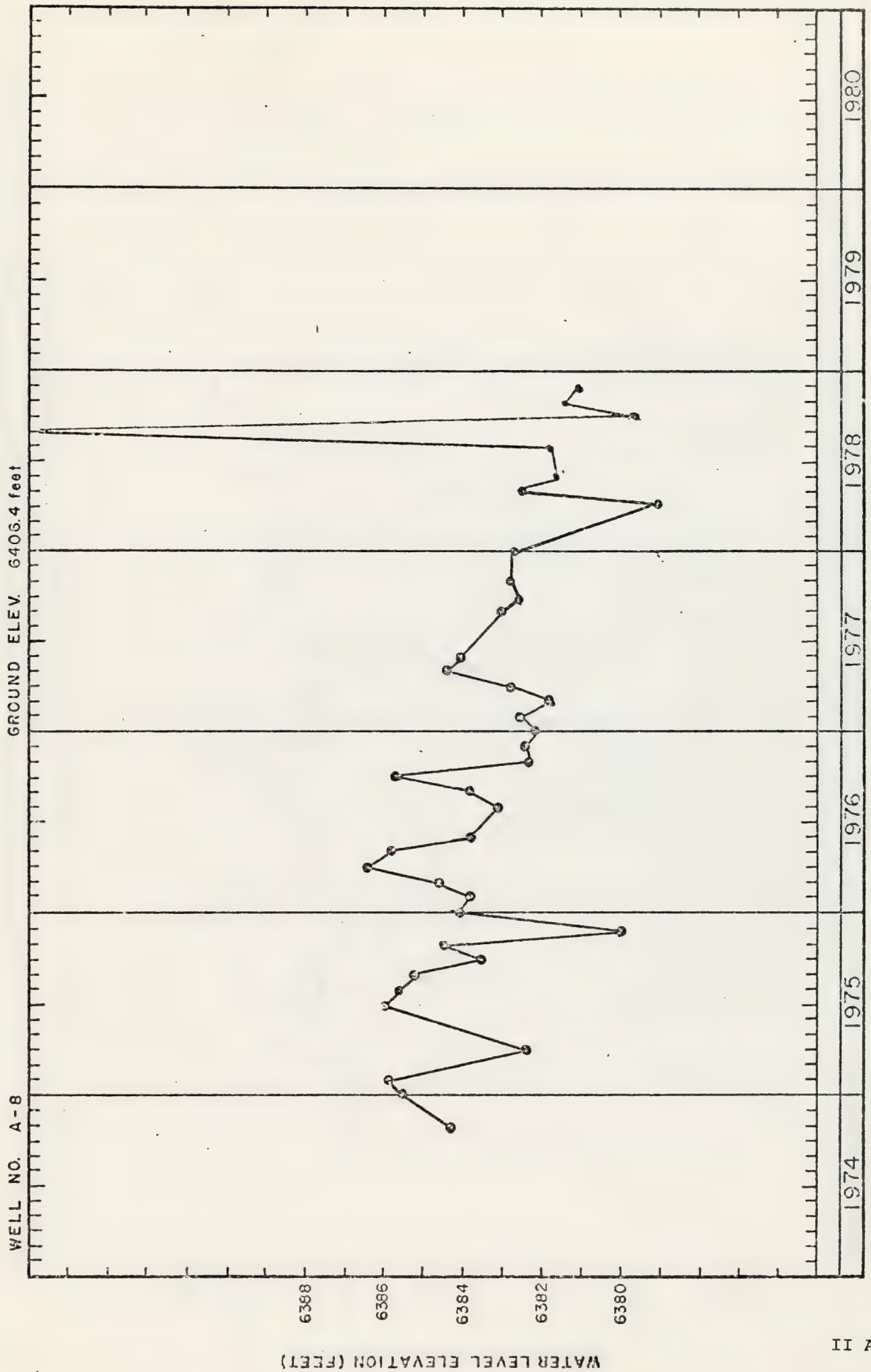




WATER LEVEL DATA

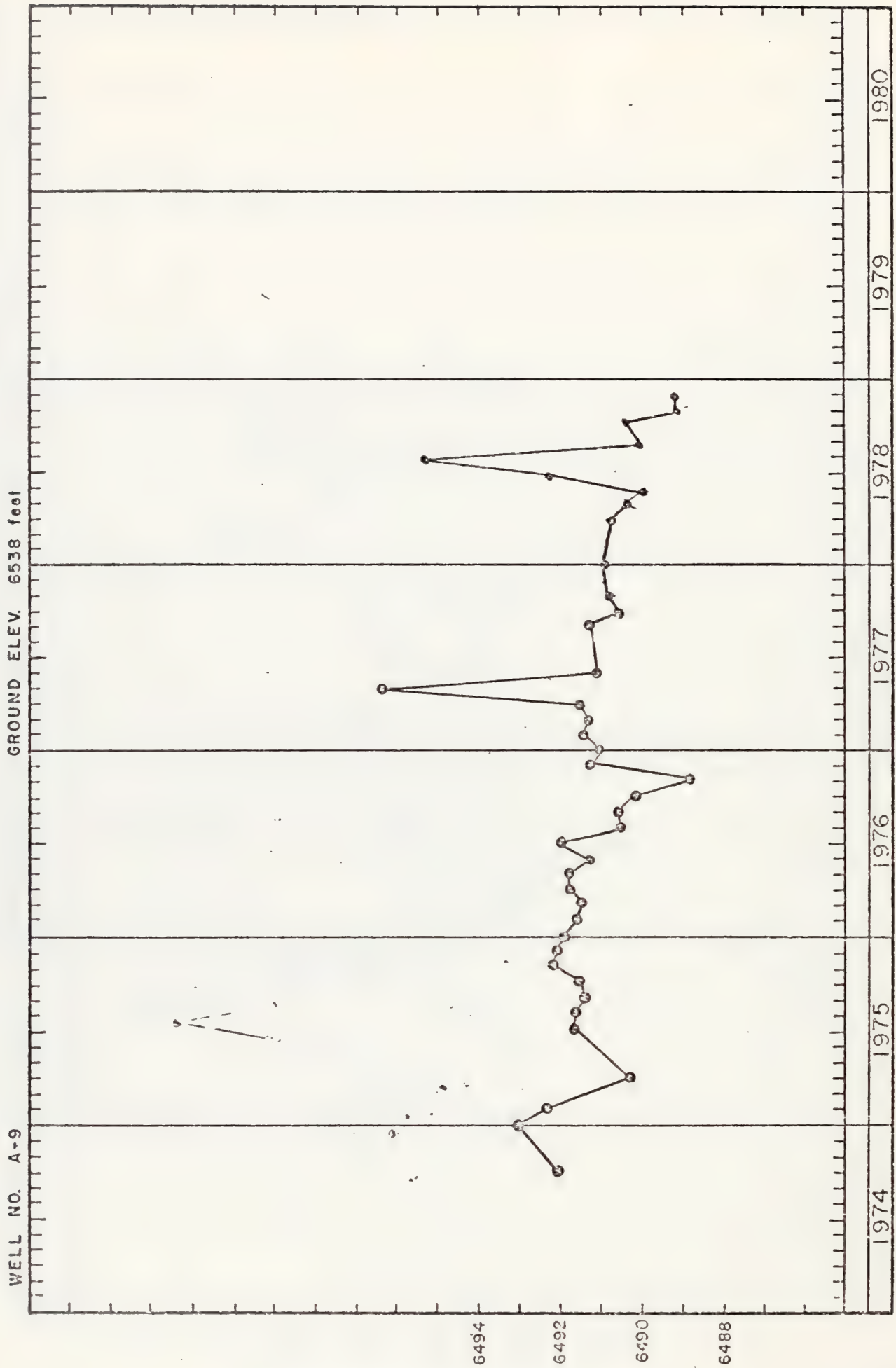


WATER LEVEL DATA

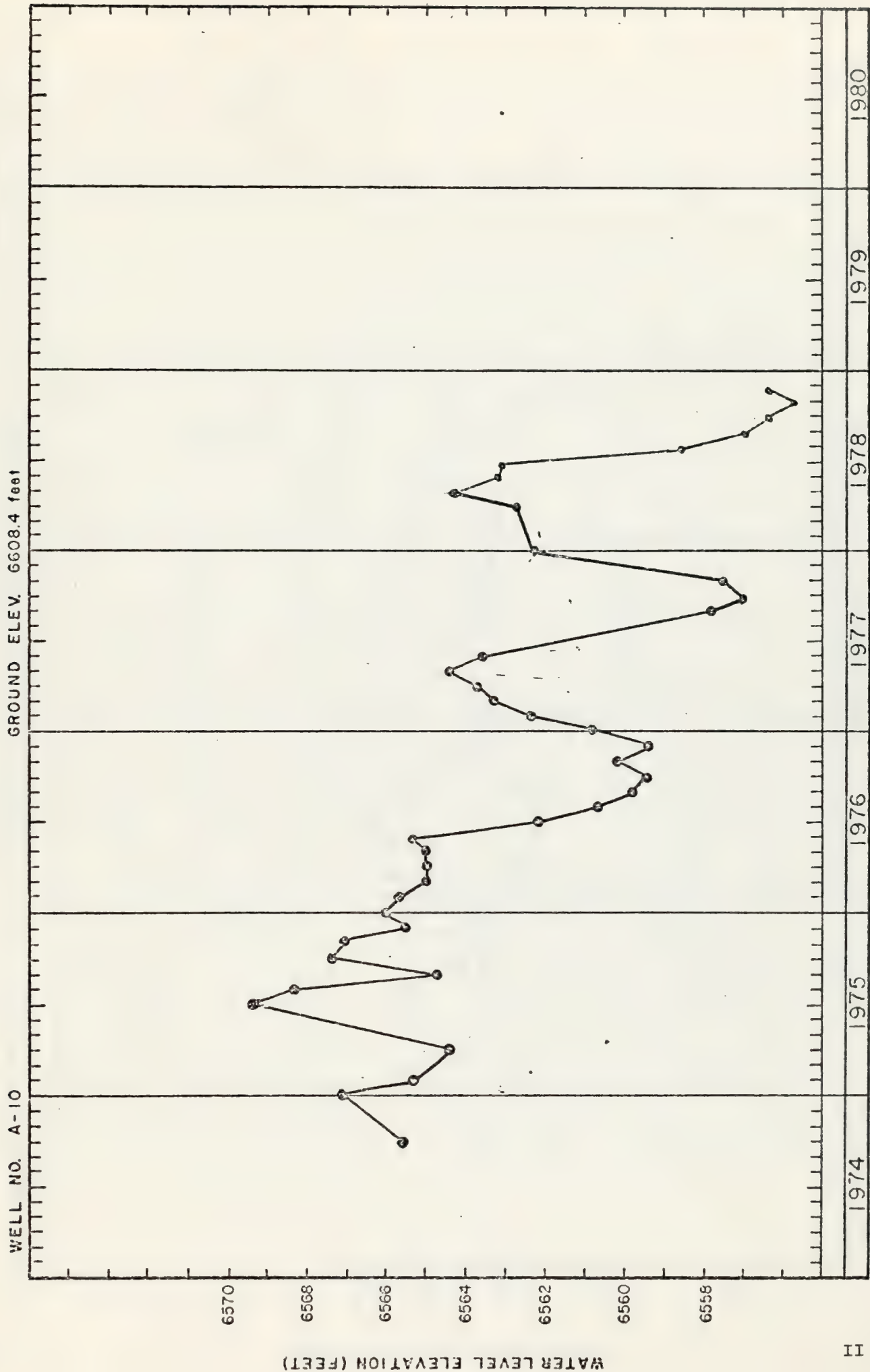


WATER LEVEL DATA

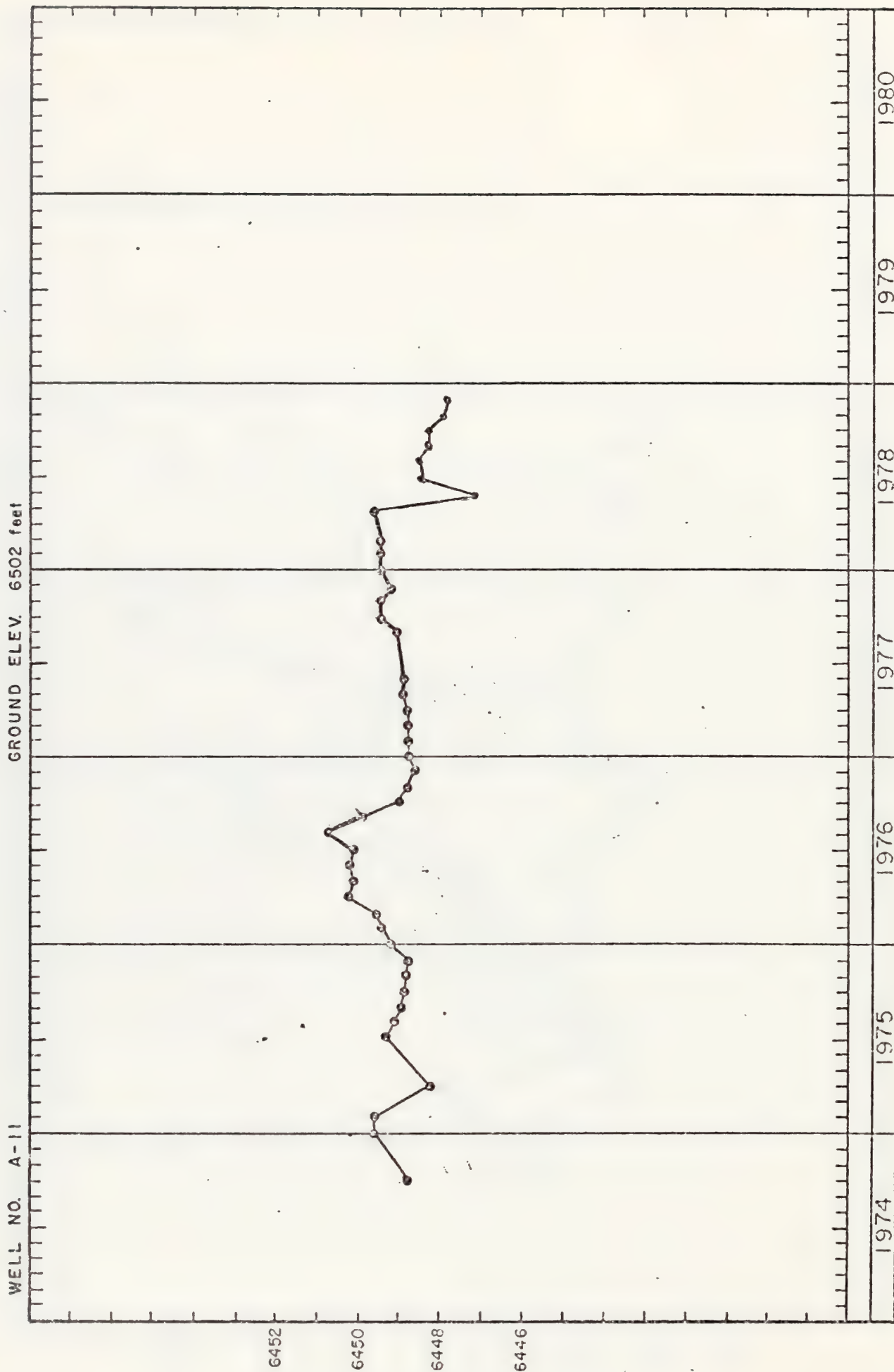




WATER LEVEL DATA

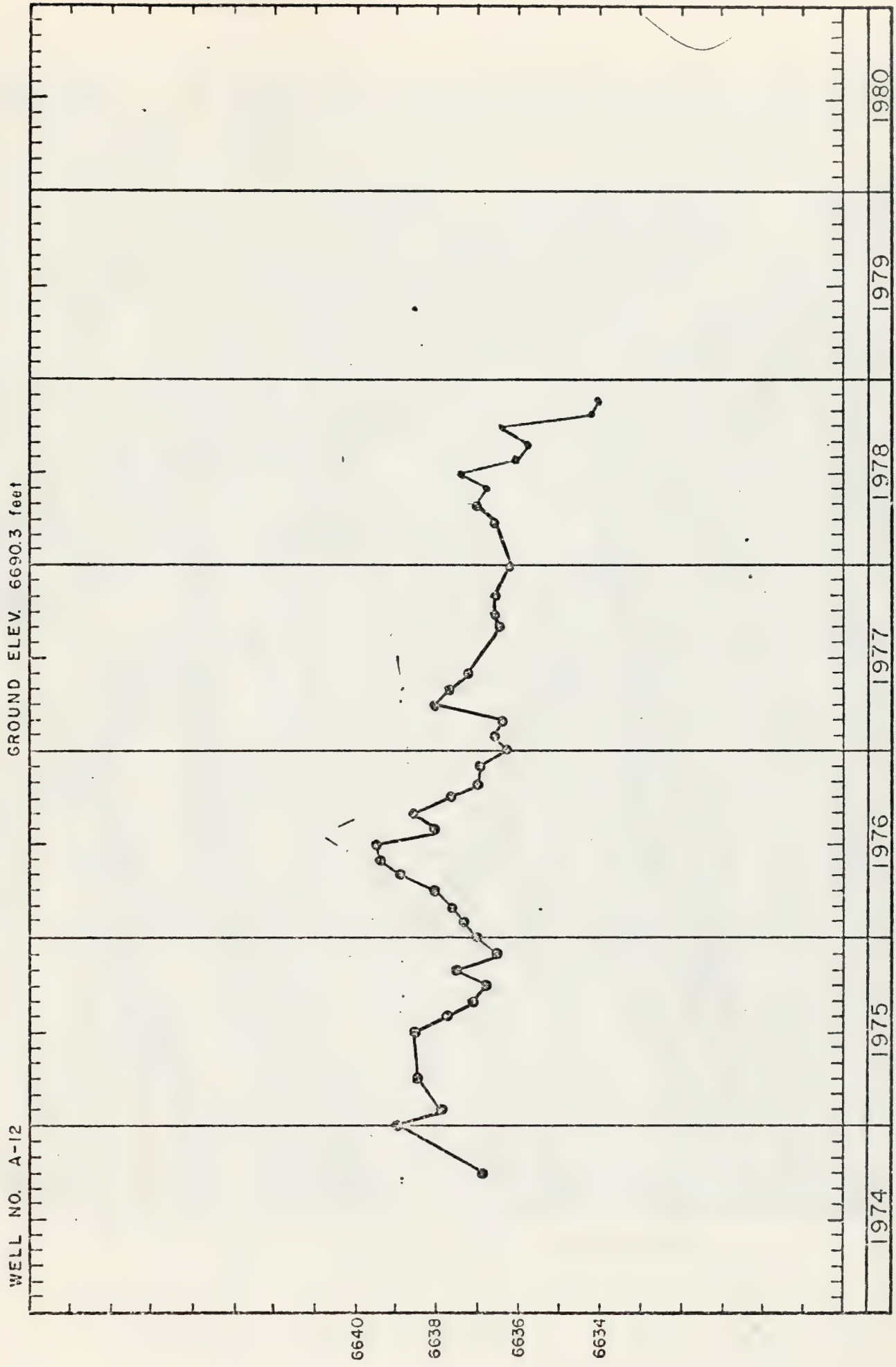


WATER LEVEL DATA

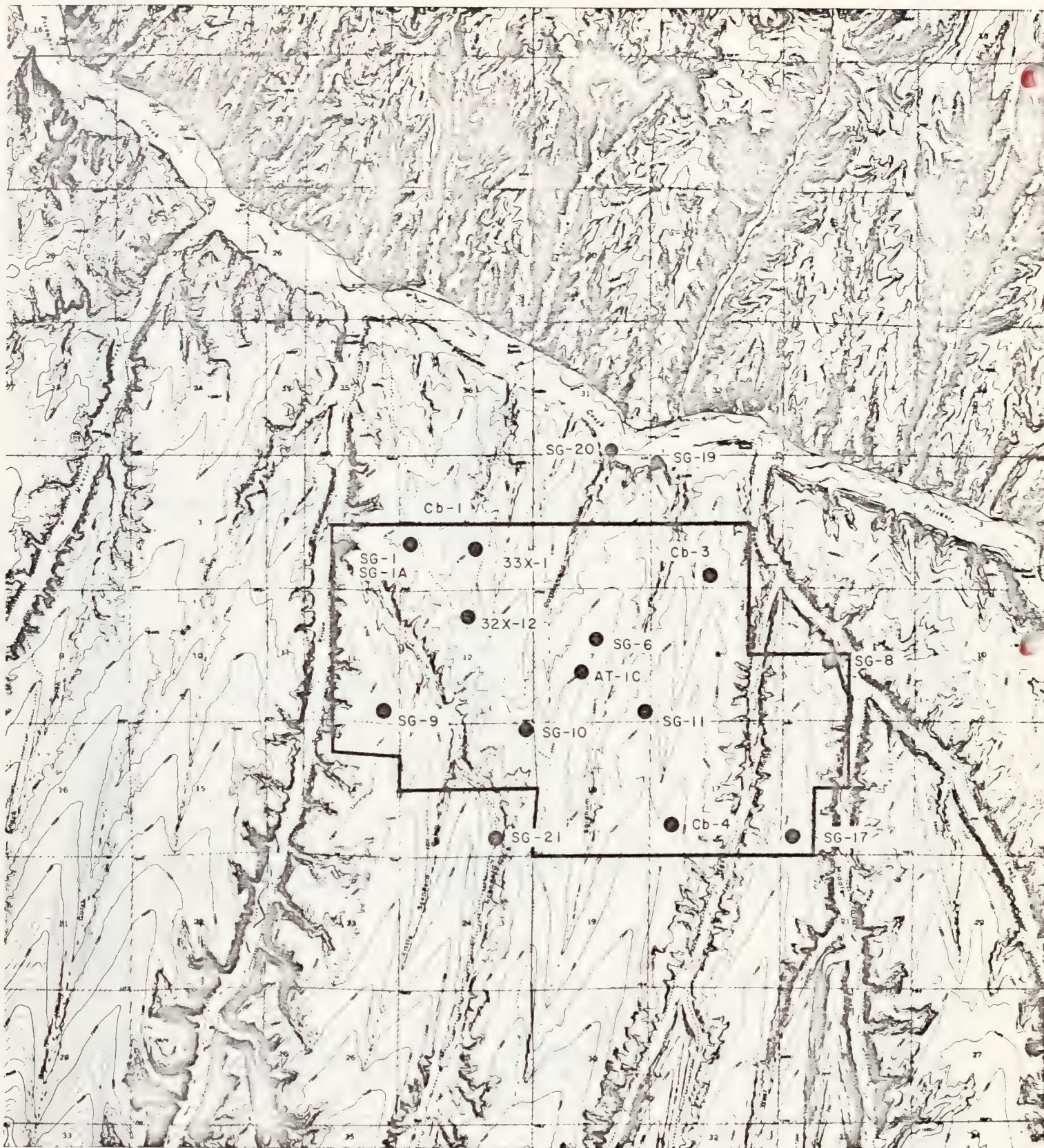


WATER LEVEL DATA





WATER LEVEL DATA



DEEP WELL MONITORING NETWORK  
Cb TRACT

Figure II A-4



## Water Levels in Upper Aquifer Wells

A. Water Level Table

B. Water Level Plots



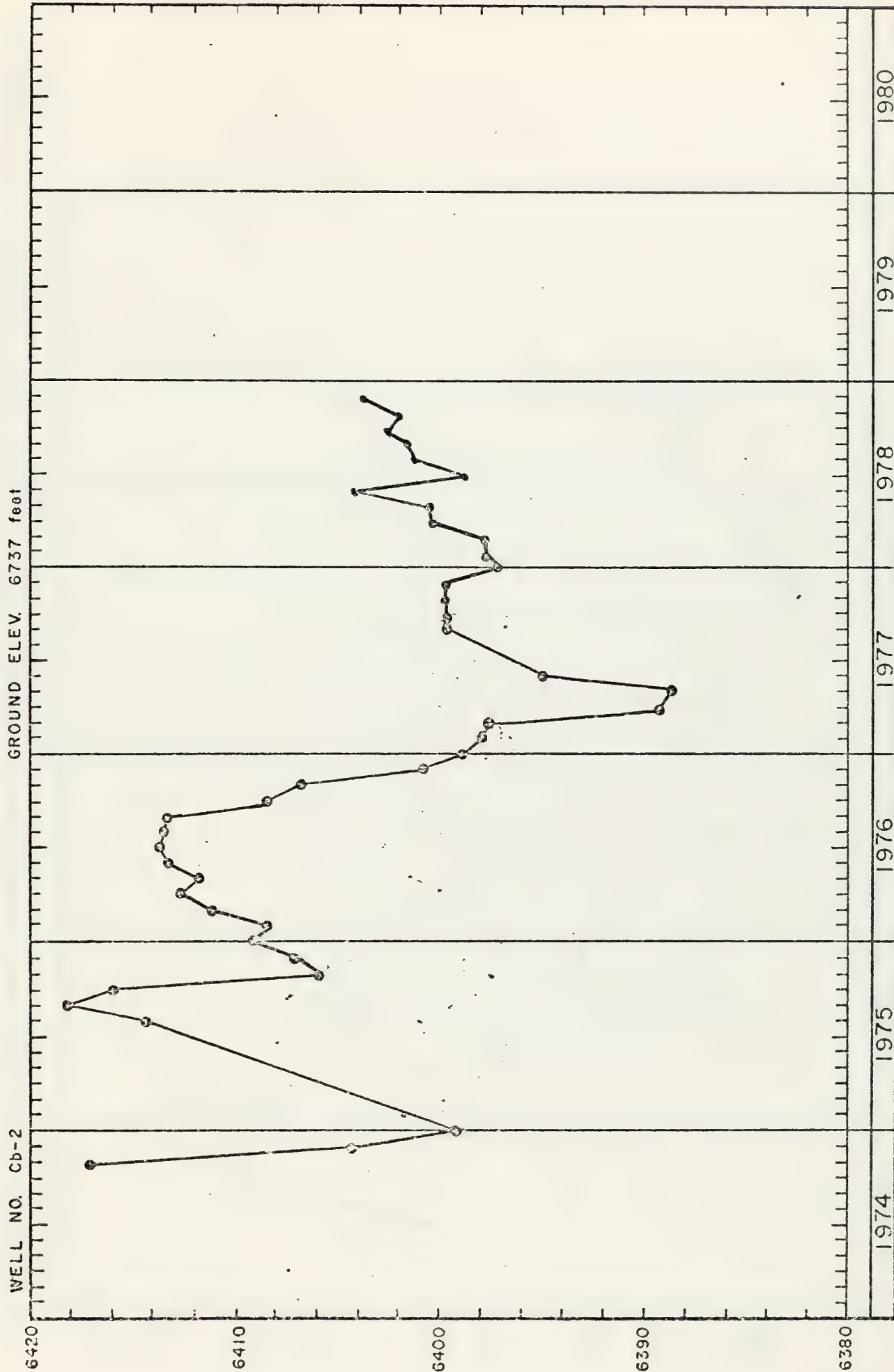
TABLE II A-4

CB-TRACT  
WATER LEVELS IN UPPER AQUIFER WELLS  
FOR SAMPLE DATE SHOWN

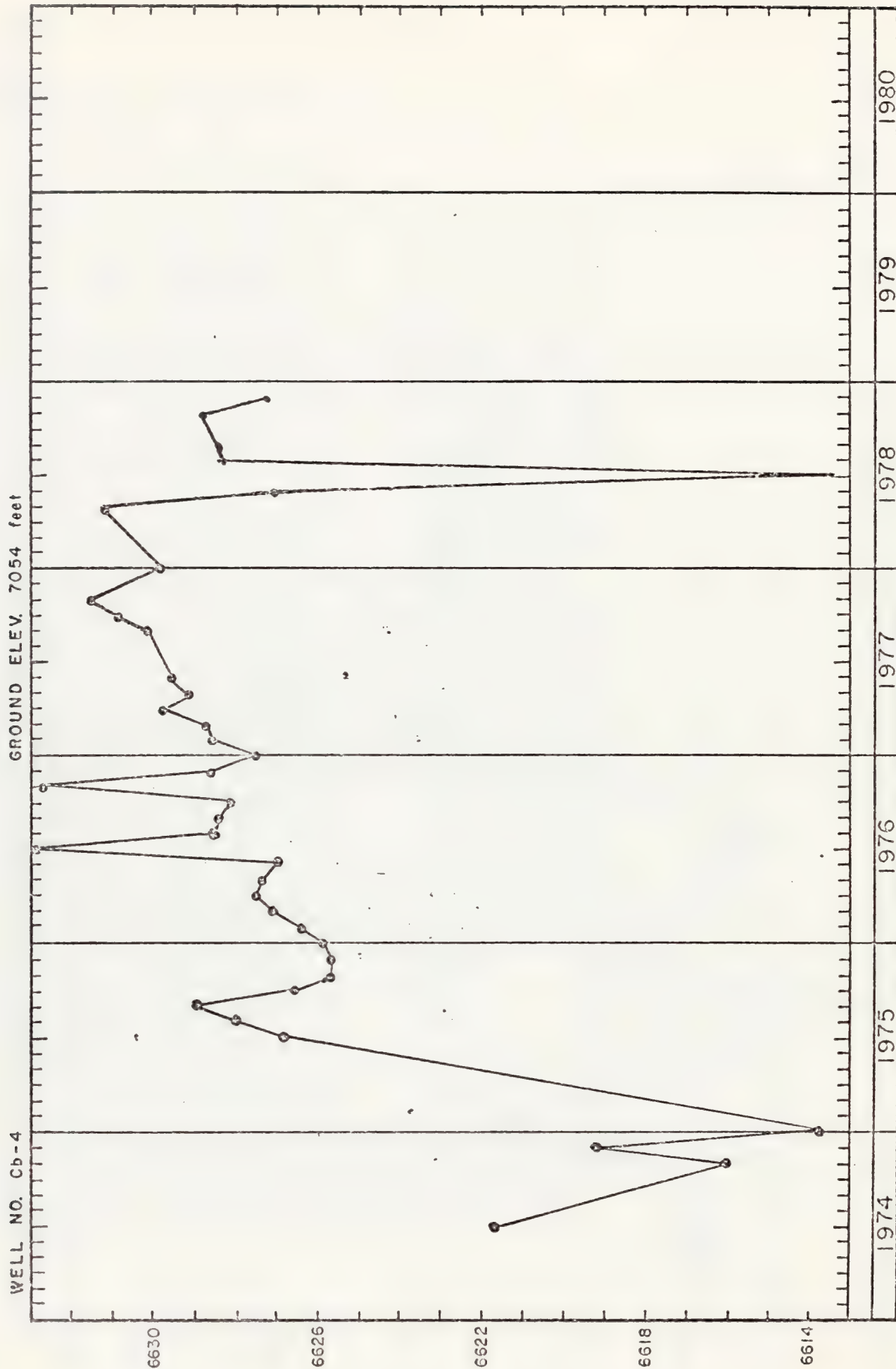
WELL ID	WX02	WX04	WX10	WX12	WX17	WX19	WX20	WX21	WX55	WX63	WX92
GROUND LEVEL											
ELEV. (FT.)	6737.0	7054.0	6950.0	6428.0	7036.0	6384.0		6811.0	6900.0	6888.0	6870.0
M.P. ELEV. (FT.)	6737.0	7057.3	6953.6	6428.6	7038.6	6384.4		6813.3	6903.1	6890.7	6873.0
YR.	Depth (FT)	Depth (FT)	Depth (FT)	Depth (FT)	Depth (FT)	Depth (FT)	Depth (FT)	Depth (FT)	Depth (FT)	Depth (FT)	Depth (FT)
MO.											
77	9	6399.9	6630.8	6574.0	6357.4	6639.0	6373.9	-1.0	6705.0	6551.1	6520.9
	10	6399.9	6631.5	6574.6	6356.4	6638.9	6370.7	-1.0	6704.6	6551.1	6520.5
	11	6399.9		6356.1	6356.1	6638.9	6370.9	-1.0	6704.6	6551.0	
	12	6396.7	6629.8	6575.5	6357.3	6639.6	6371.0	-1.0	6704.6	6550.4	6518.0
78	1	6397.8		6357.3				-1.0		6550.7	
	2	6397.8		6357.3				-1.0		6550.7	
	3	6400.5				6373.5		-1.0	6517.3	6553.7	6518.4
	4	6400.8	6631.2	6576.6	6356.4	6639.5	6374.3	-1.0	6704.4	6516.2	6520.2
	5	6404.2	6627.3	6573.4	6365.6	6635.5	6375.2	-1.0	6703.0	6548.3	6521.2
	6	6399.3	6320.0		6366.1		6375.8	-1.0	6706.1	6552.1	6498.0
	7	6401.5	6628.5		6366.5	6637.5	6376.4	-1.0	6705.5	6551.6	6496.8
	8	6402.0	6628.6		6365.8	6637.2	6374.15	-1.0	6704.9	6551.5	6496.7
	9	6403.1			6366.6	6638.9	6375.1	-1.0	6705.4	6554.0	6496.6
	10	6402.75	6629.18		6367.85	6638.7	6375.31	-1.0	6705.2	6548.1	6507.09
	11	6404.4	6627.13	6578.85	6348.55	6634.35	6373.3	-1.0	6705.05	6554.88	6511.4
											6496.

NOTE: -1.0 INDICATES WELL IS FLOWING  
 -2.0 INDICATES WELL IS DRY  
 -3.0 INDICATES WELL IS PLUGGED

REFER TO TABLE IV A-1 FOR LOCATION CODES



WATER LEVEL DATA

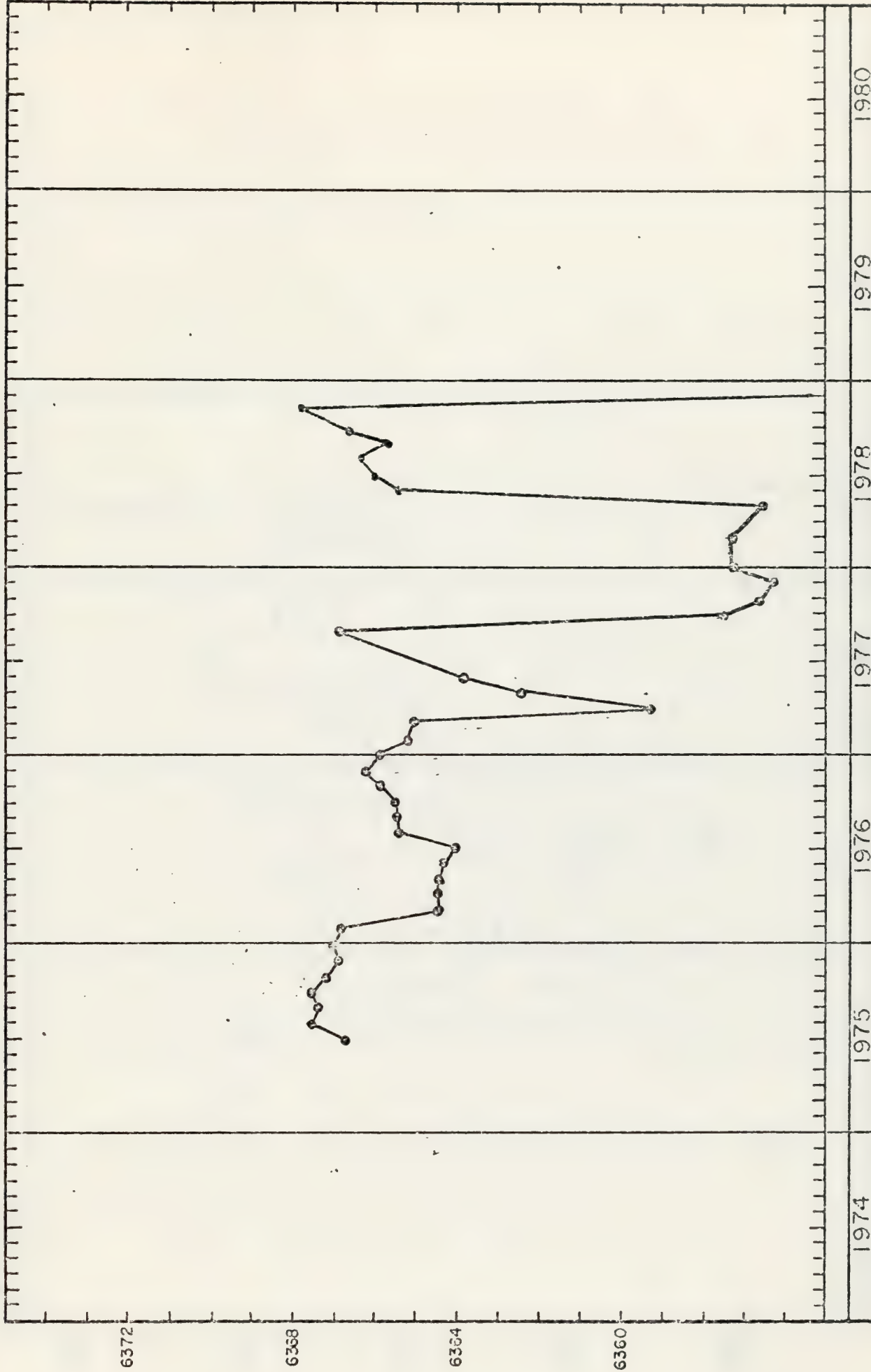


WATER LEVEL DATA

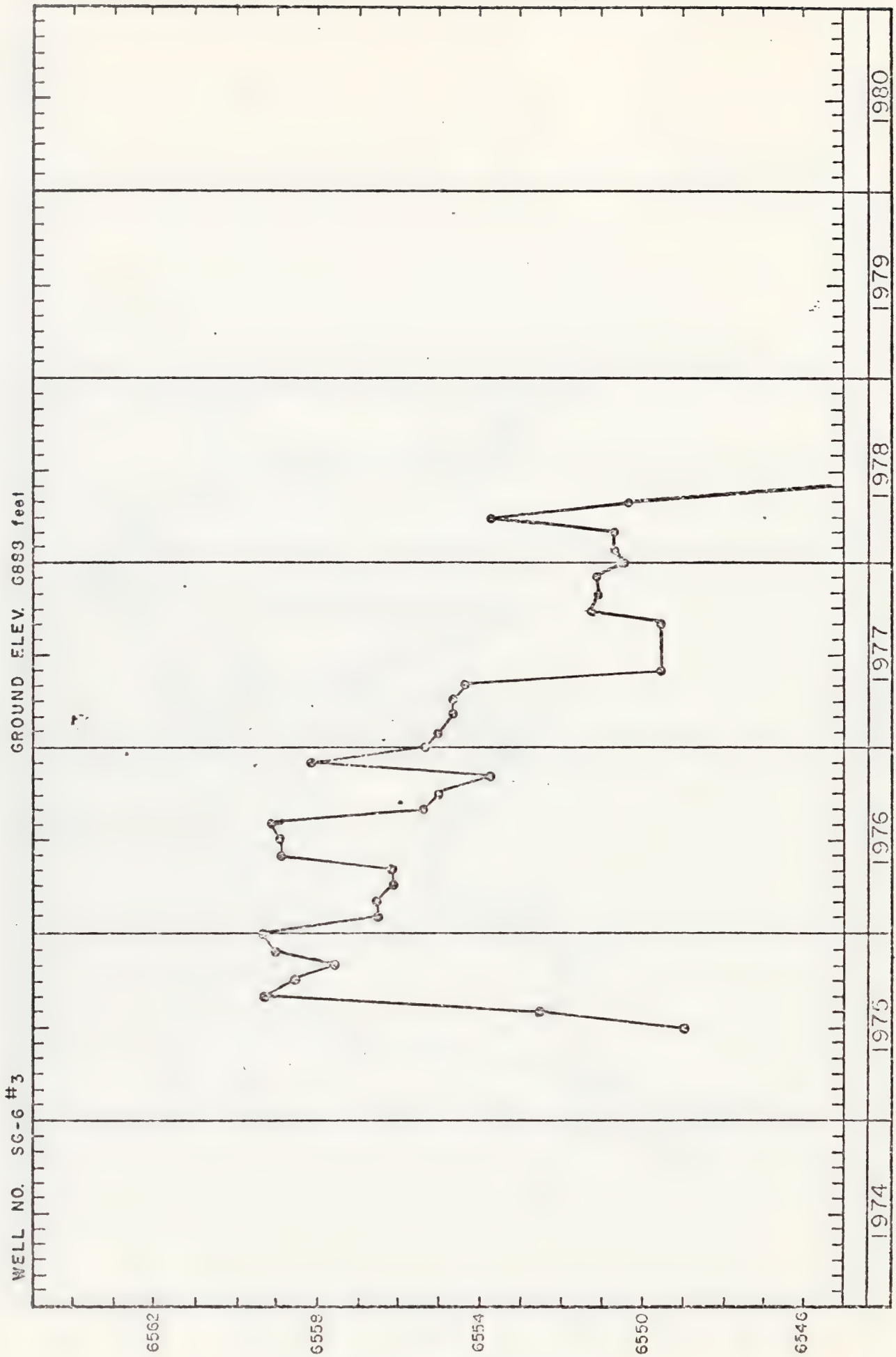


WELL NO. SG-1 #2

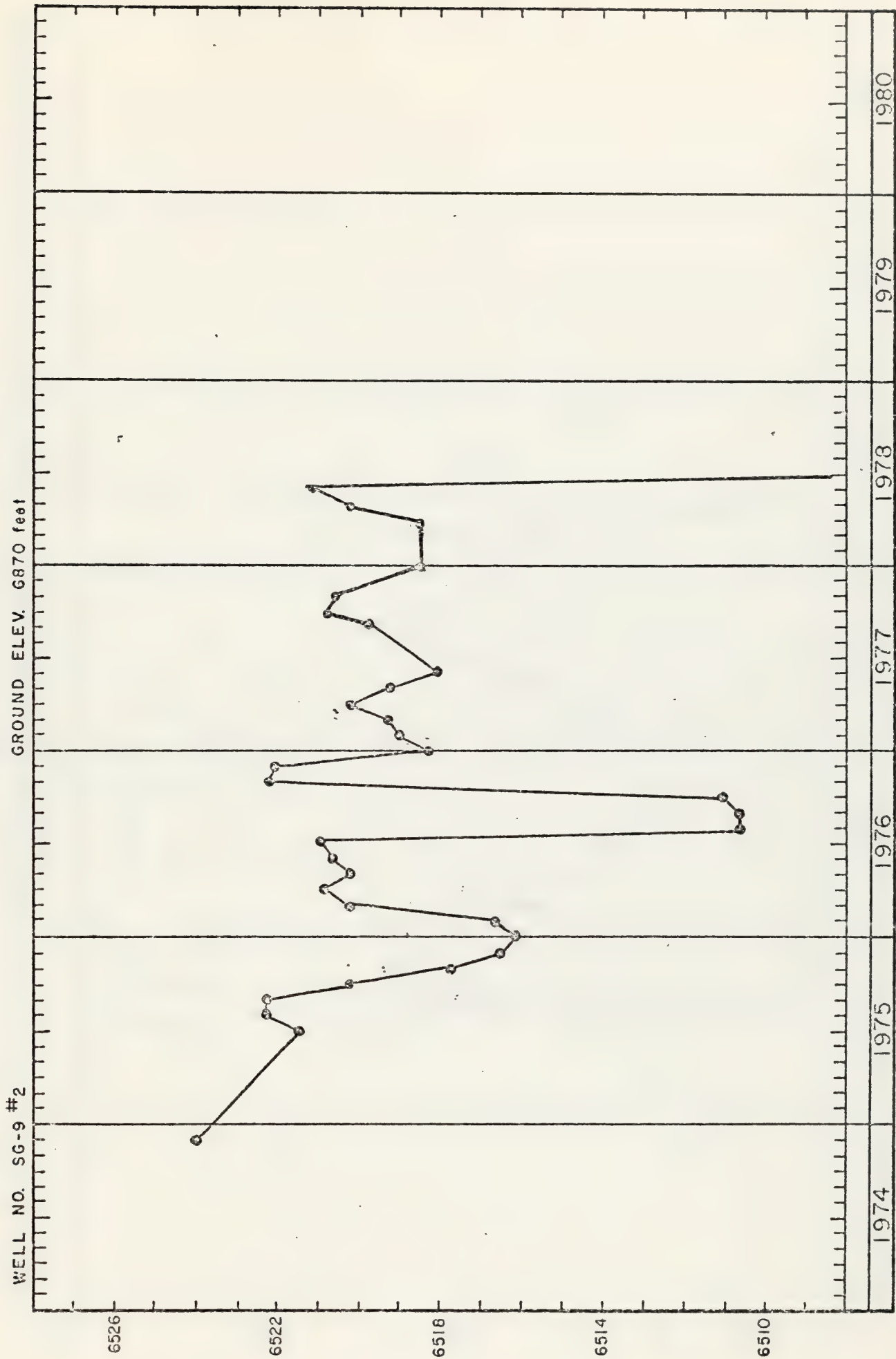
GROUND ELEV. 6428 feet



WATER LEVEL DATA

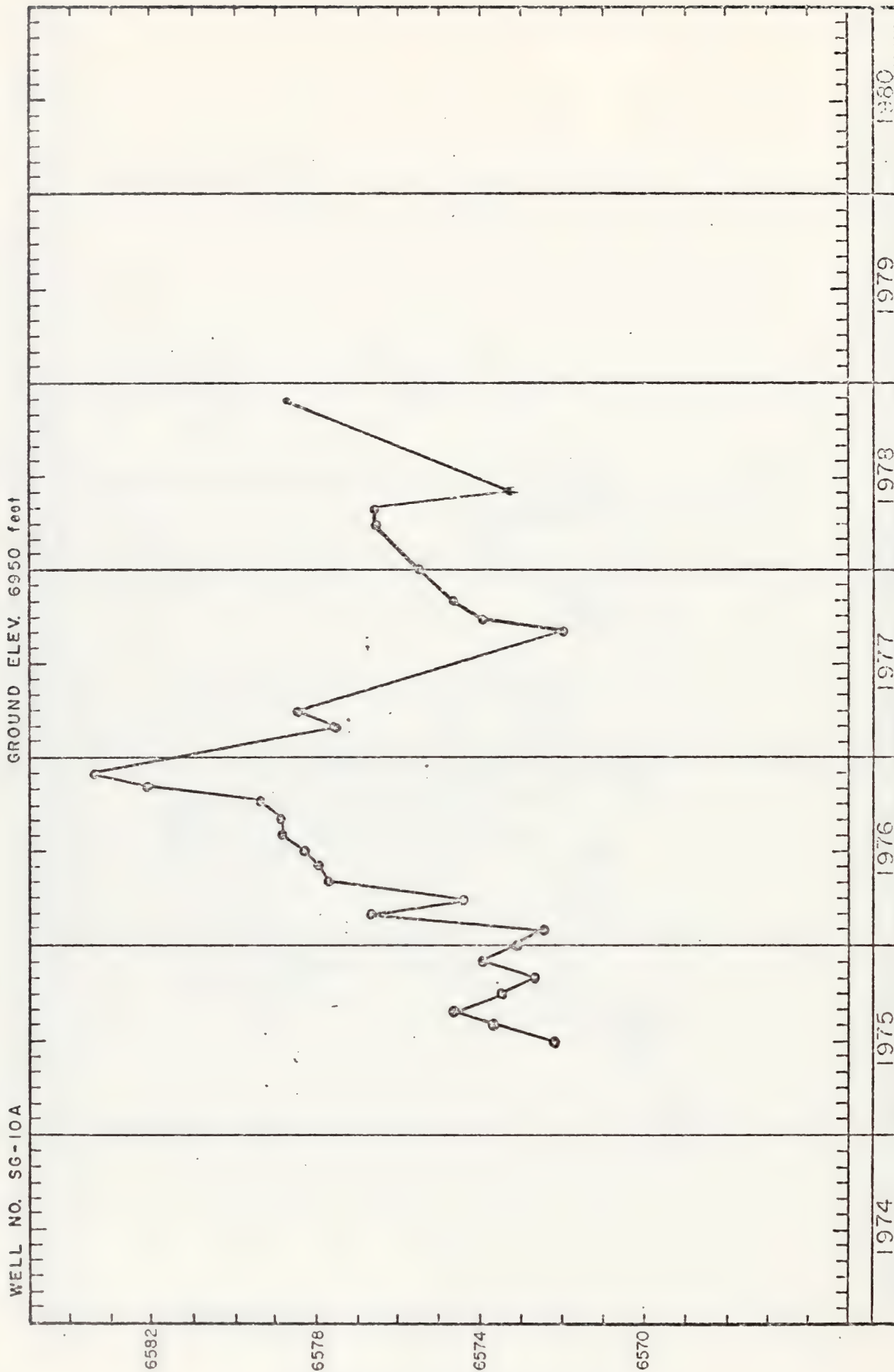


WATER LEVEL DATA

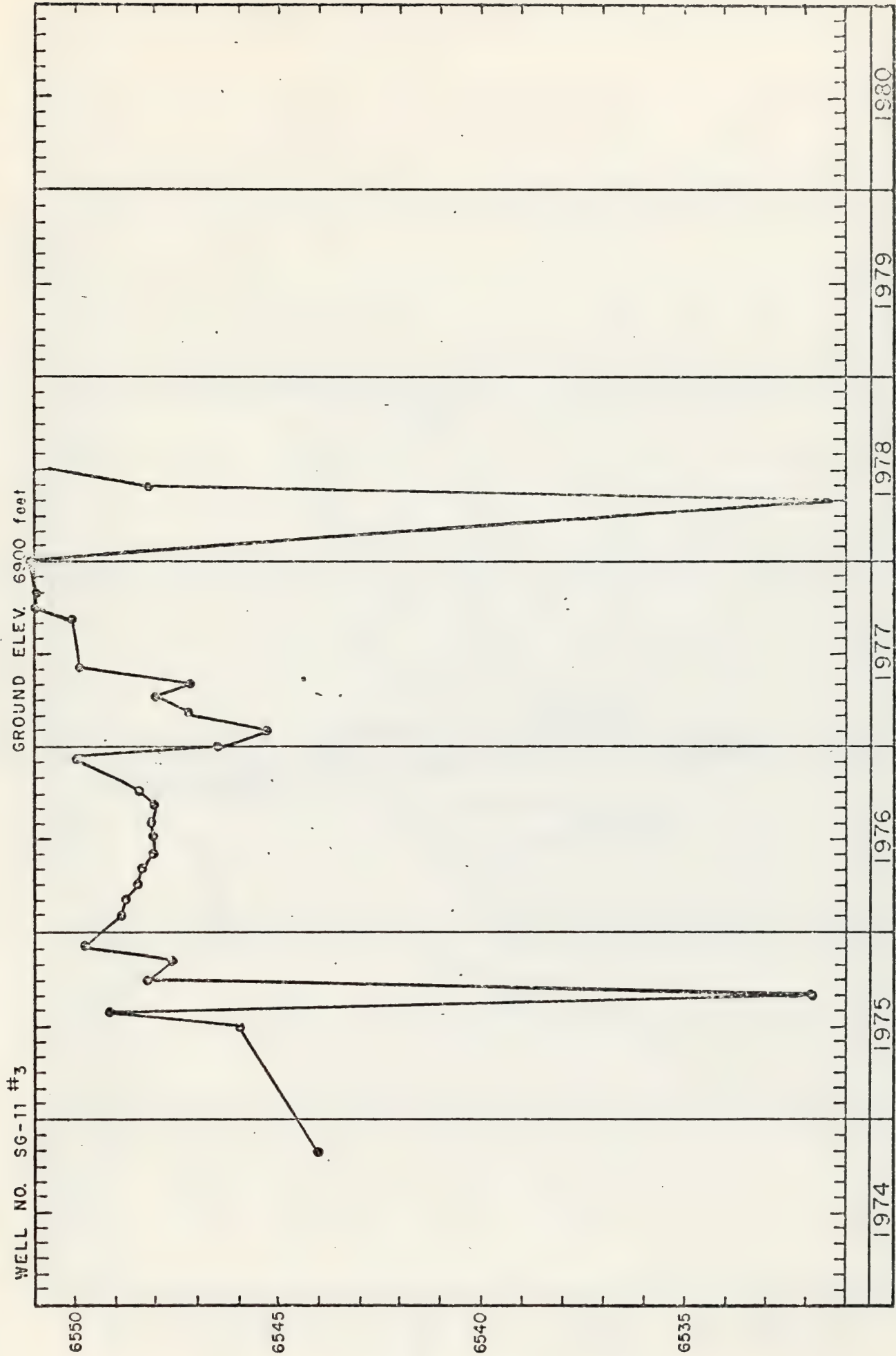


WATER LEVEL ELEVATION (FEET)





WATER LEVEL DATA

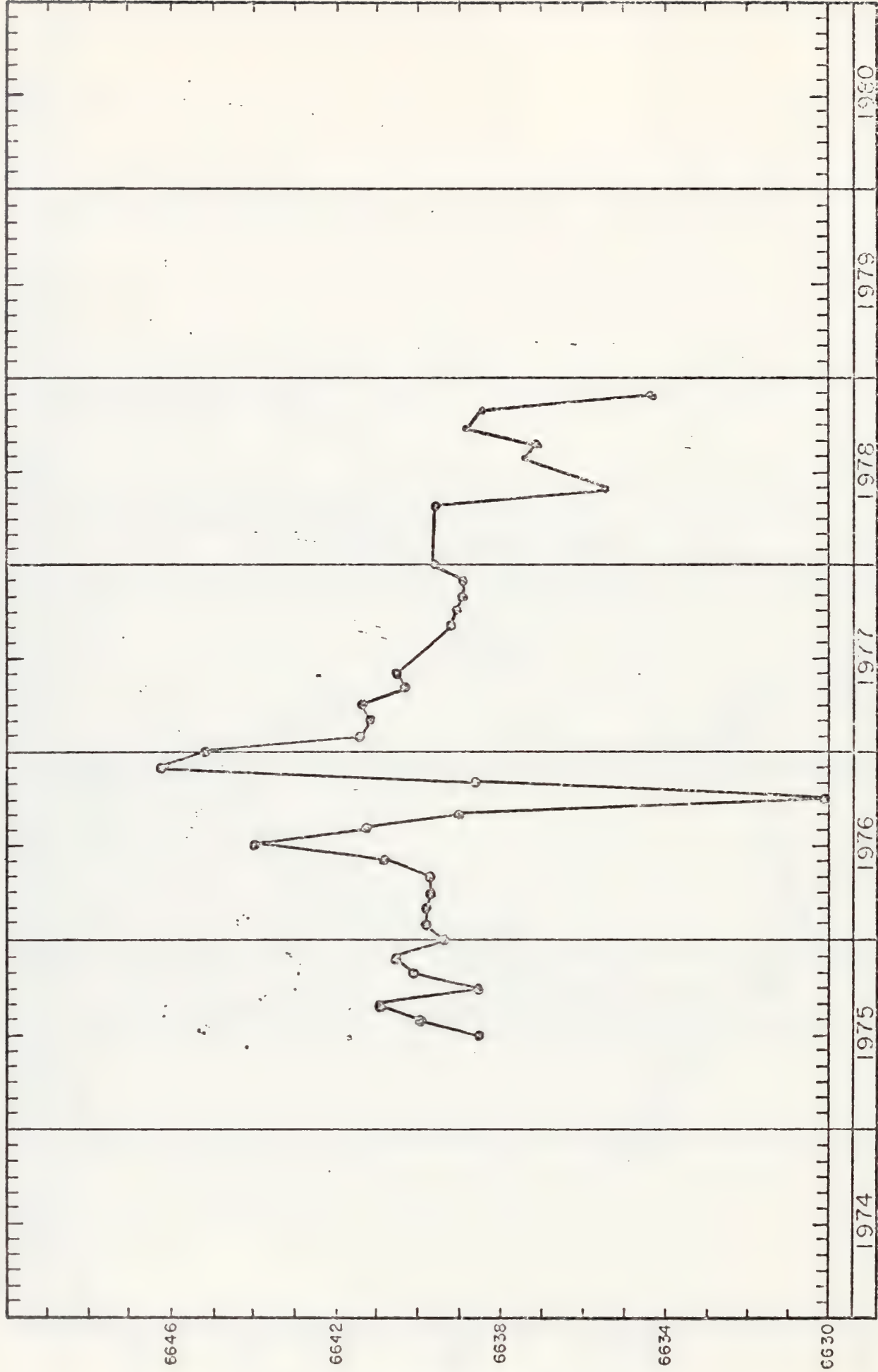


WATER LEVEL DATA

WELL NO. SG-17 #2

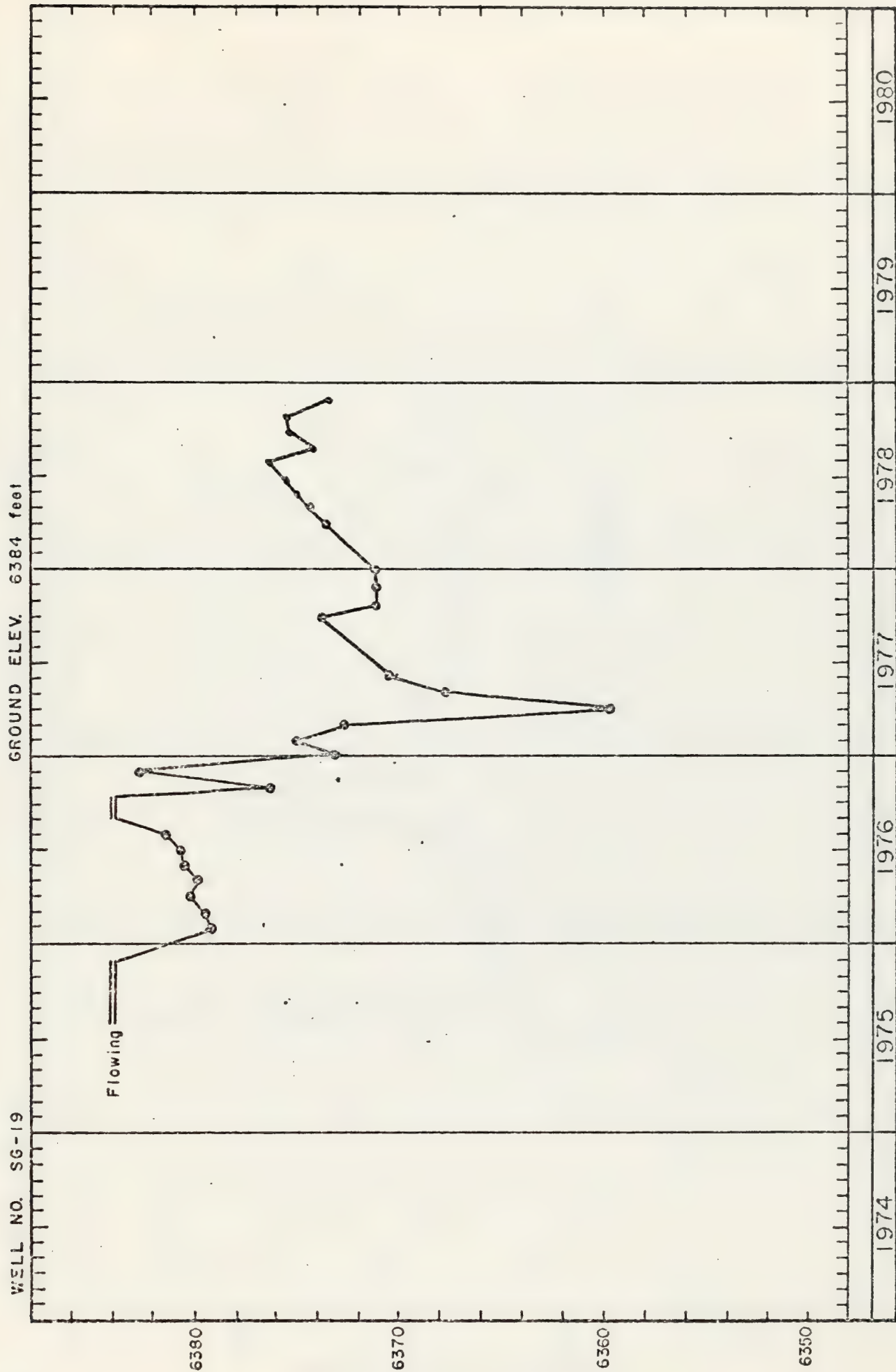
GROUND ELEV. 7036 feet

WATER LEVEL ELEVATION (FEET)



WATER LEVEL DATA





WATER LEVEL DATA

WELL NO. SG-20

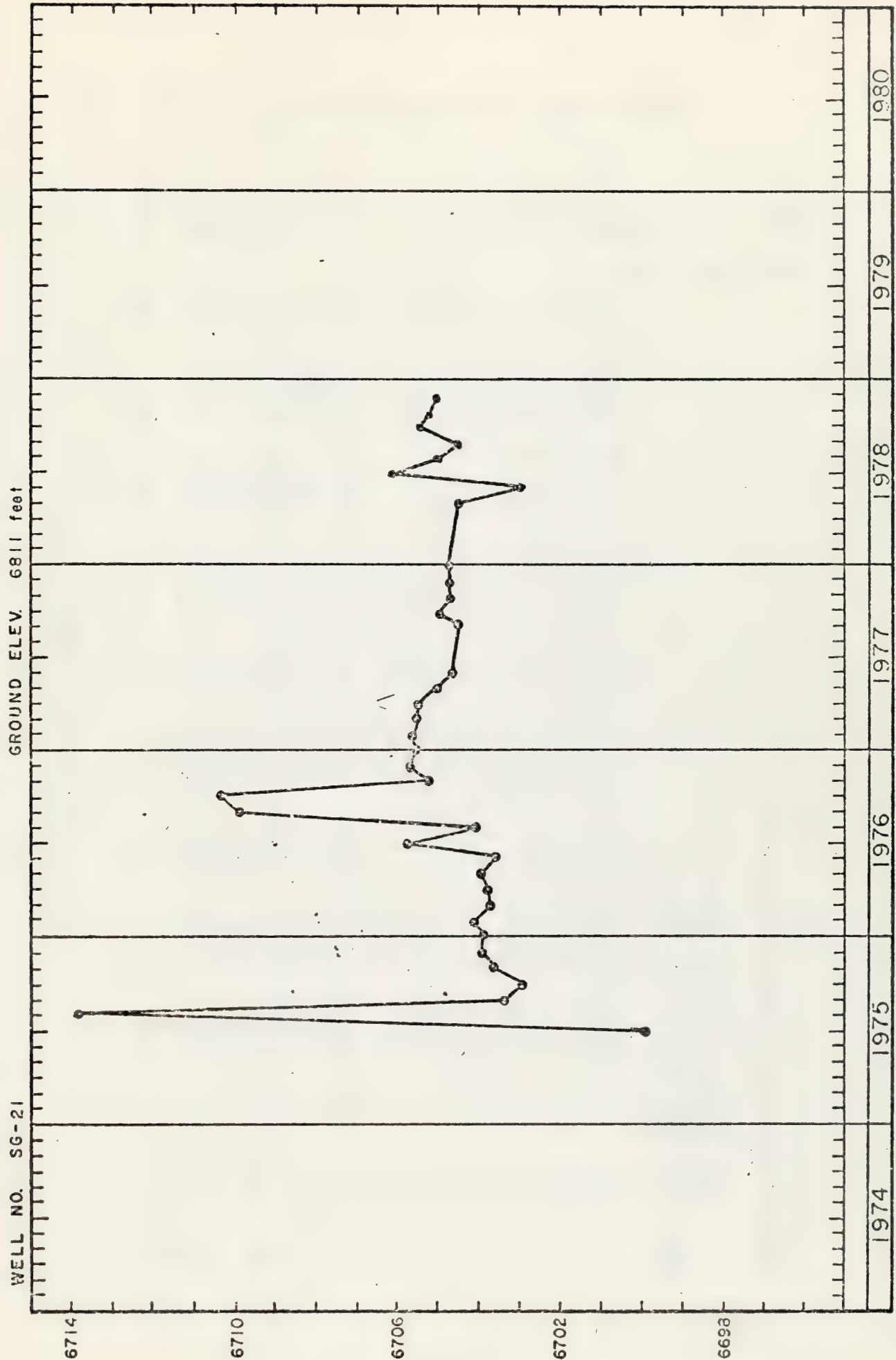
GROUND ELEV.

WATER LEVEL ELEVATION (FEET)

FLOWING

1974	1975	1976	1977	1978	1979	1980

WATER LEVEL DATA



WATER LEVEL DATA



## Water Levels in Lower Aquifer Wells

- A. Water Level Table
- B. Water Level Plots

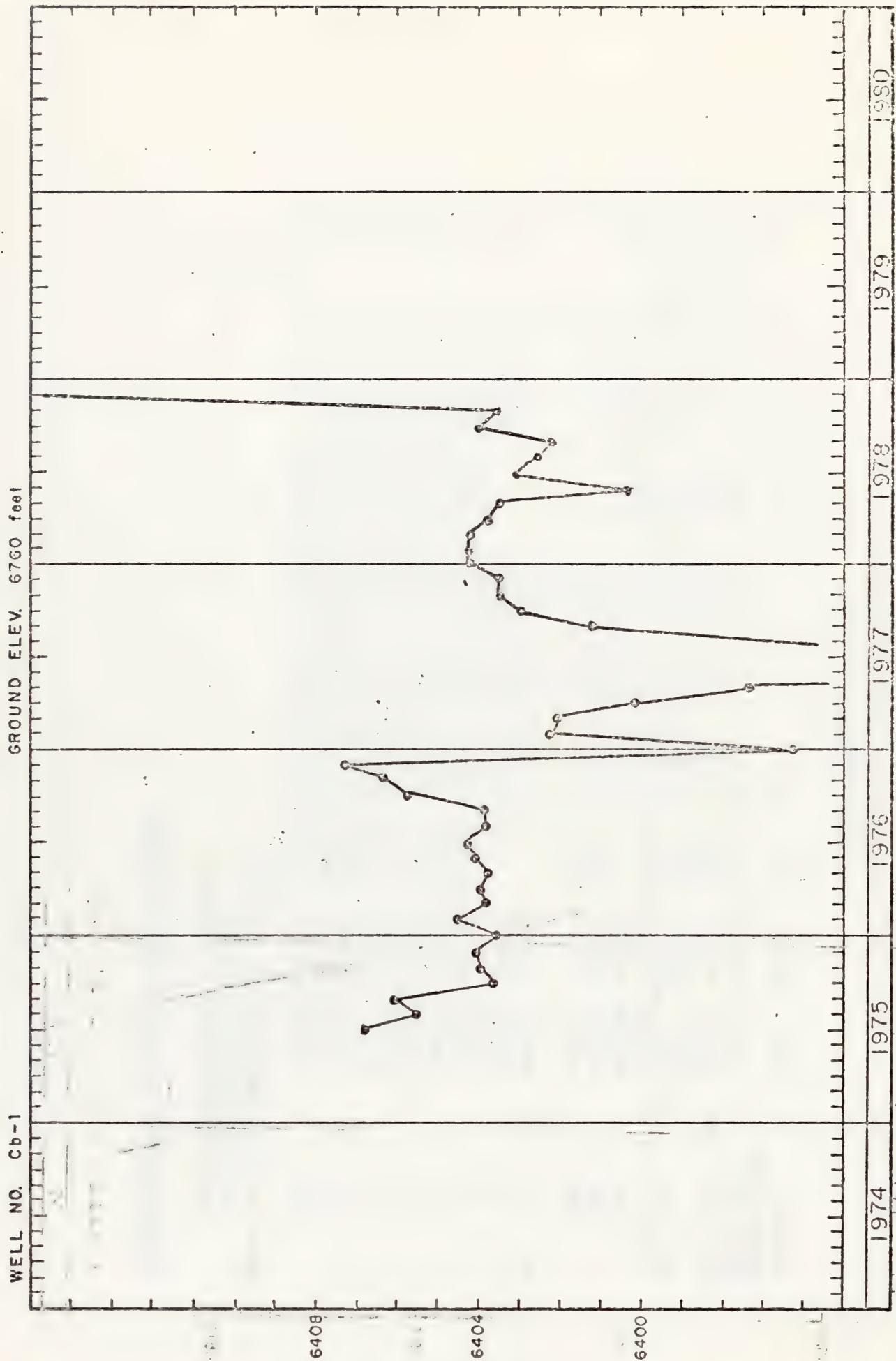
TABLE II A-5

CB - TRACT  
WATER LEVEL IN LOWER AQUIFER WELLS  
FOR SAMPLE DATE SHOWN

WELL ID	WY01	WY12	WY17	WY32	WY33	WY45	WY52	WY61	WY81	WY91
GROUND LEVEL										
ELEV. (FT)	6760.0	6428.0	7036.0	6830.3	6707.1	6905.0	6900.0	6888.0	6538.0	6870.0
M.P. ELEV. (FT)	6763.4	6428.8	7038.6	6830.3	6707.1	6906.0	6903.1	6890.7	6540.8	6873.0
Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)
77	9	6403.0	6366.3	6639.6	6474.8	6391.5	6515.5	6507.5	6508.5	-3.0
	10	6403.4	6366.7		6474.9	6391.5	6514.8	6507.4	6508.1	-3.0
	11	6403.4	6366.0	6641.4	6474.9	6391.5	6514.8		6508.2	-3.0
	12	6404.1	6365.1	6643.3	6475.1	6392.3	6514.9	6516.3	6508.0	-3.0
78	1	6404.1	6365.1		6474.5	6393.1	6514.8		6507.9	-3.0
	2	6404.1	6365.1		6474.3	6393.1	6514.8		6507.9	-3.0
	3	6403.8			6474.3	6393.3	6514.9	6517.3	6508.1	-3.0
	4	6403.5	6366.6	6644.4	6477.9	6393.3	6514.7	6540.9	6508.2	-3.0
	5	6400.3	6357.2	6641.4	6474.3	6392.0	6514.2	6512.9	6560.59	-1.0
	6	6403.1	6350.3		6464.3	6387.85	6513.6	6518.4	6550.3	-1.0
	7	6402.7	6350.9	6644.2	6476.5	6394.1	6513.8	6517.8	6549.55	6519.7
	8	6402.3	6350.5	6644.0	6476.2	6393.6	6513.9	6517.6	6549.6	-1.0
	9	6403.9	6350.8	6645.1	6469.64	6378.97	6513.71	6520.35	6551.7	-1.0
	10	6403.56	6351.9	6644.72	6470.42	6380.05	6513.75	6518.0	6548.93	-1.0
	11	6482.4	6367.6	6648.1	6470.14	6378.57	6510.65	6516.55	6548.45	-1.0

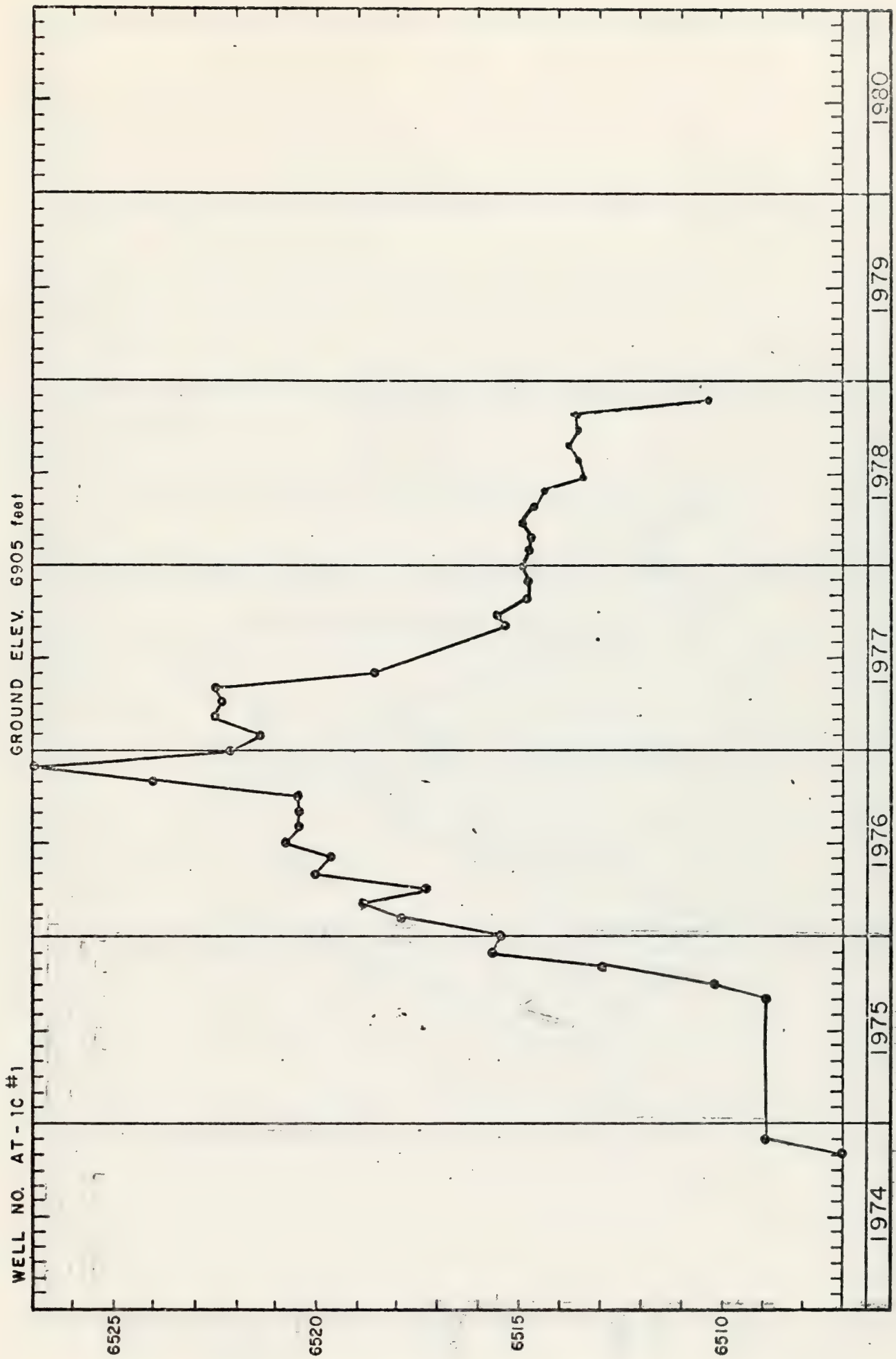
NOTE: -1.0 INDICATES WELL IS FLOWING  
 -2.0 INDICATES WELL IS DRY  
 -3.0 INDICATES WELL IS PLUGGED

REFER TO TABLE IV A-1 FOR LOCATION CODES

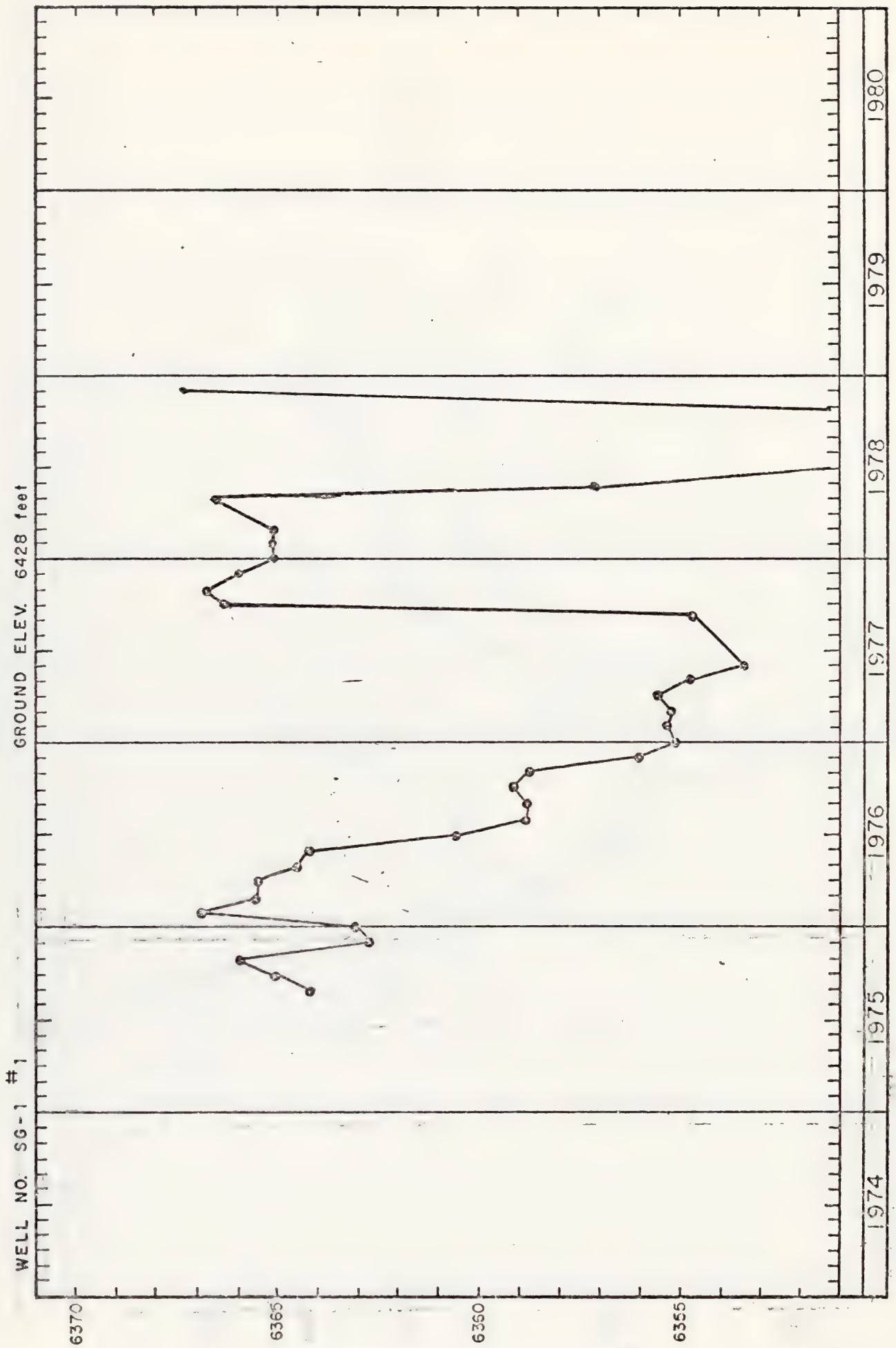


WATER LEVEL DATA

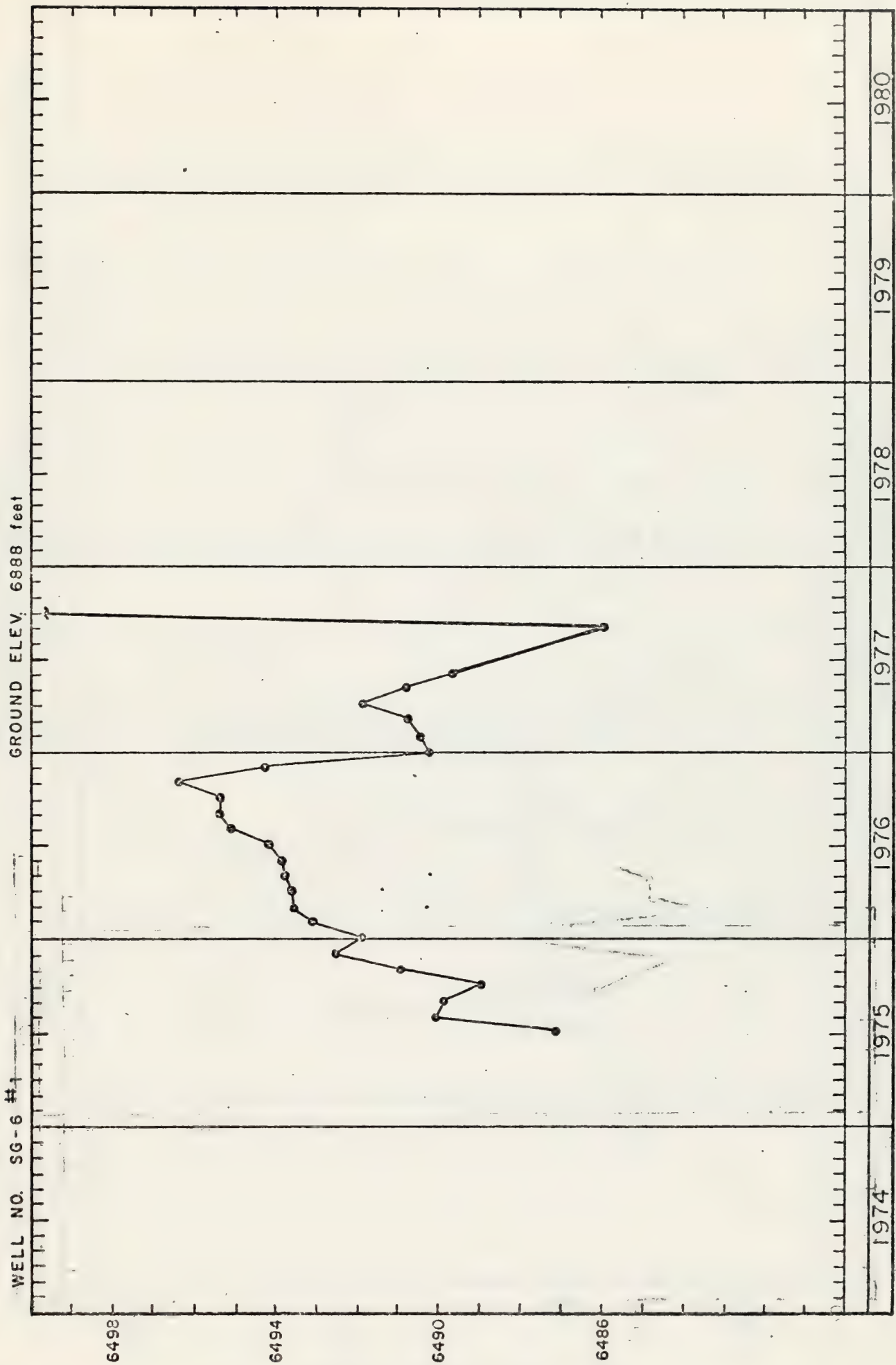




WATER LEVEL DATA

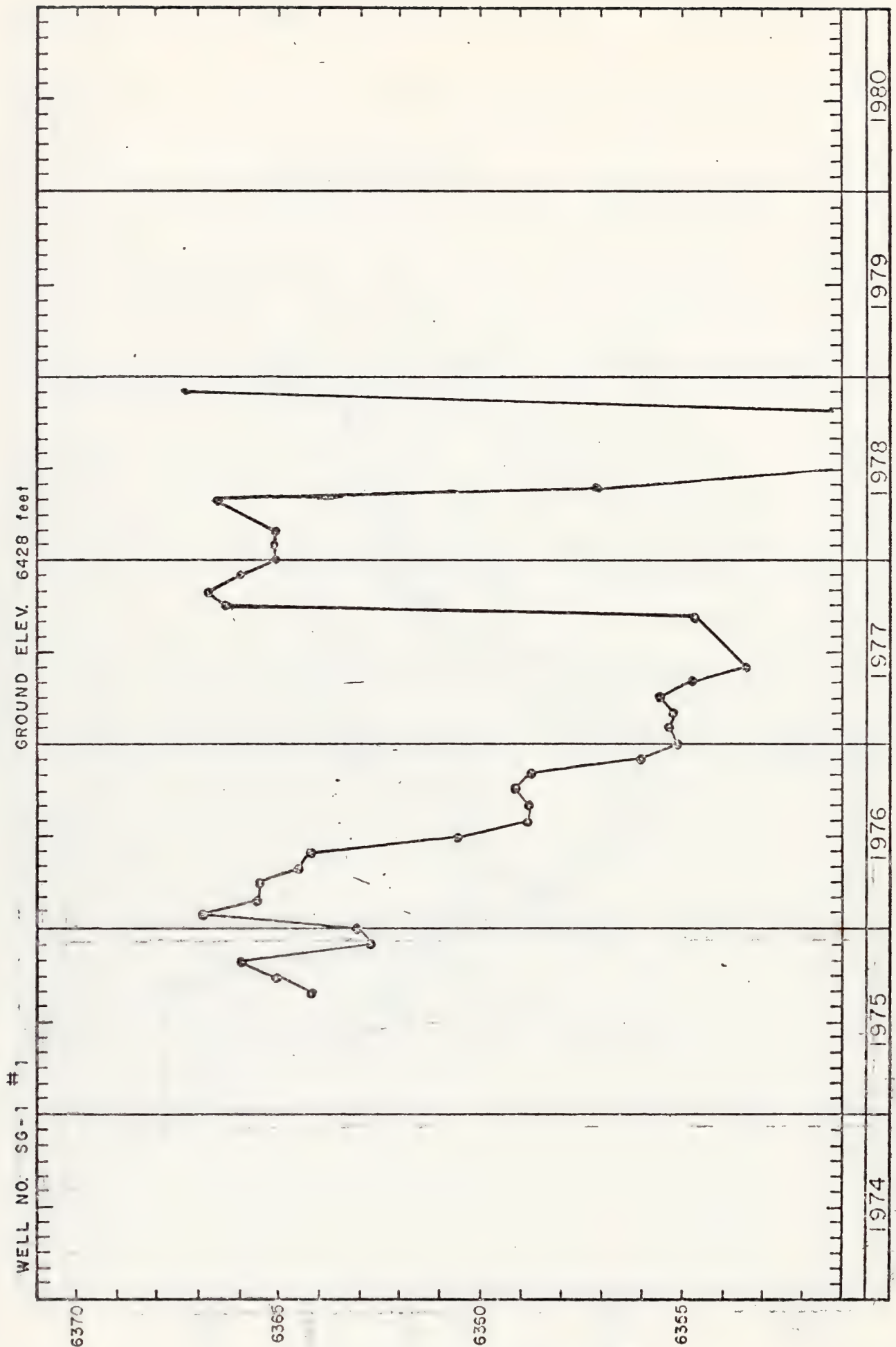


WATER LEVEL DATA

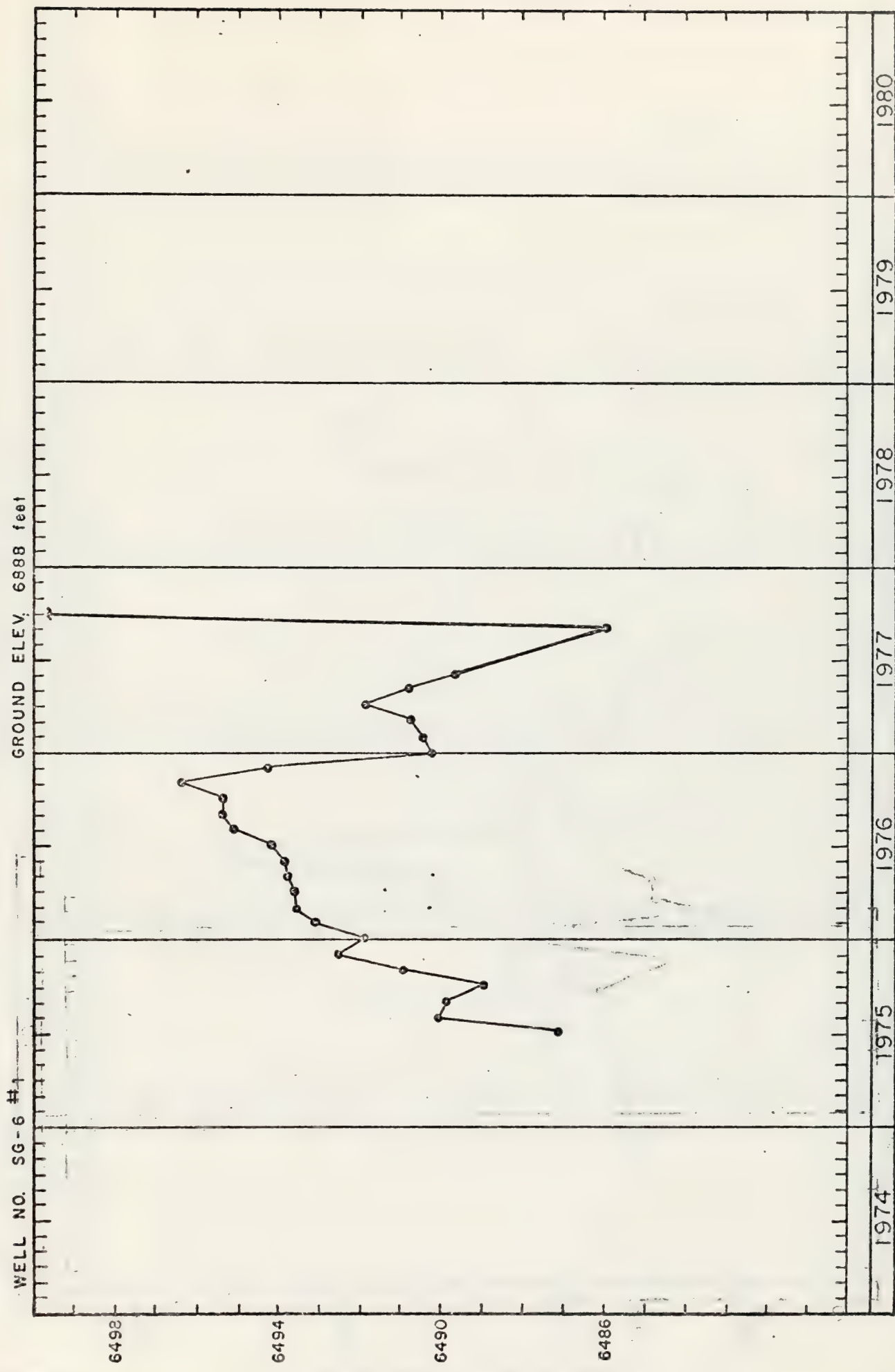


WATER LEVEL DATA





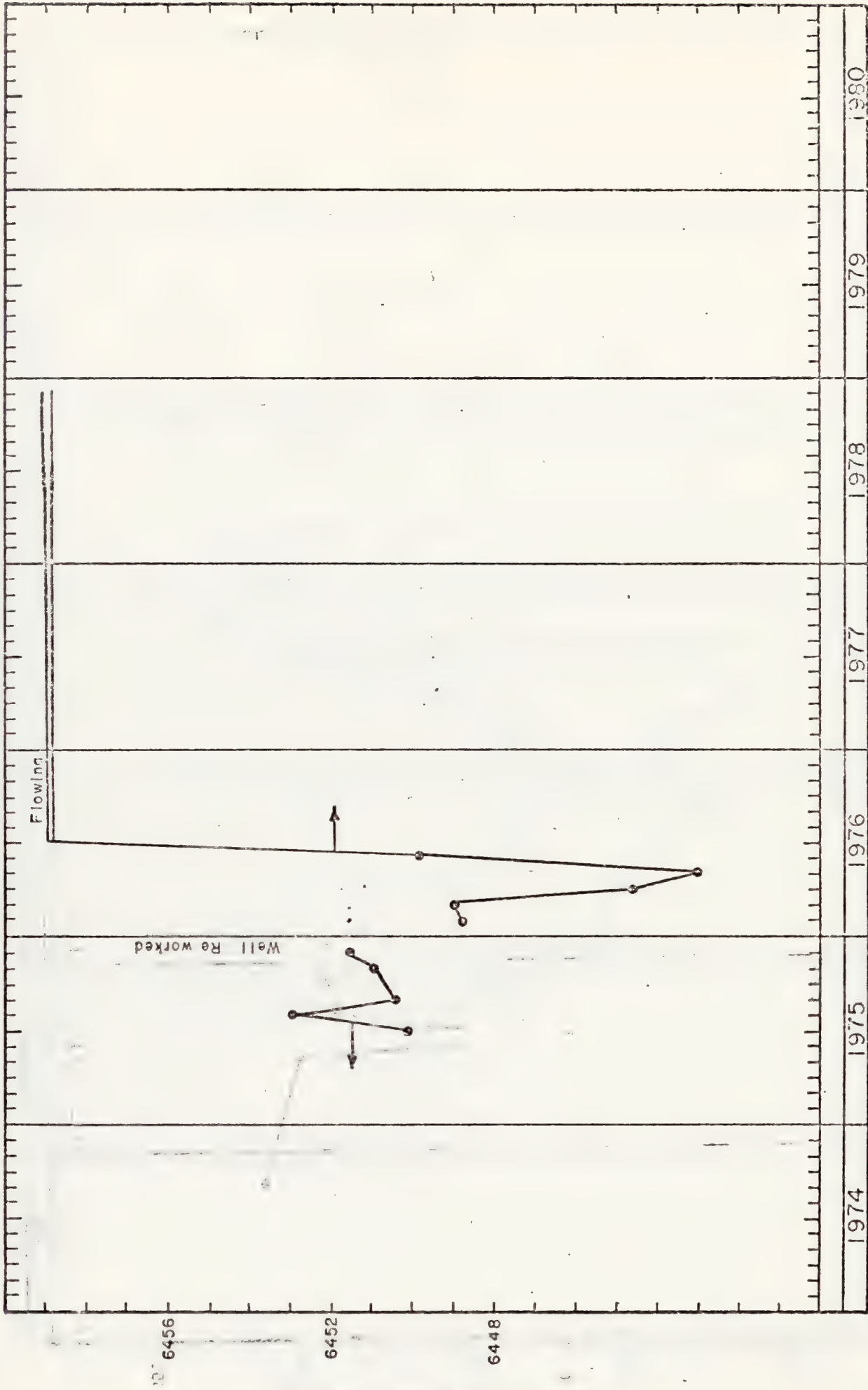
WATER LEVEL DATA



WATER LEVEL DATA

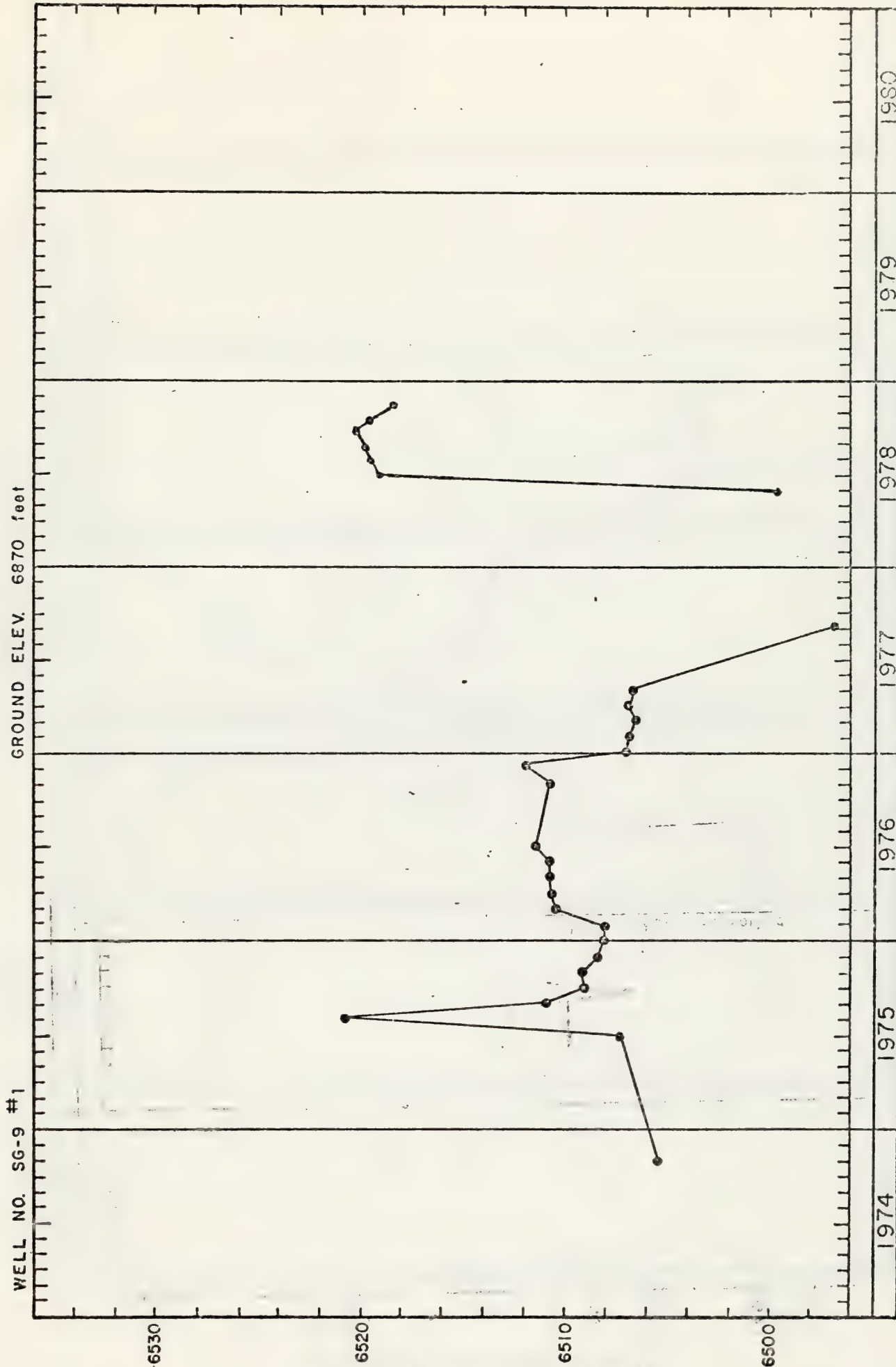
WELL NO. SG-8

GROUND ELEV. 6538 feet

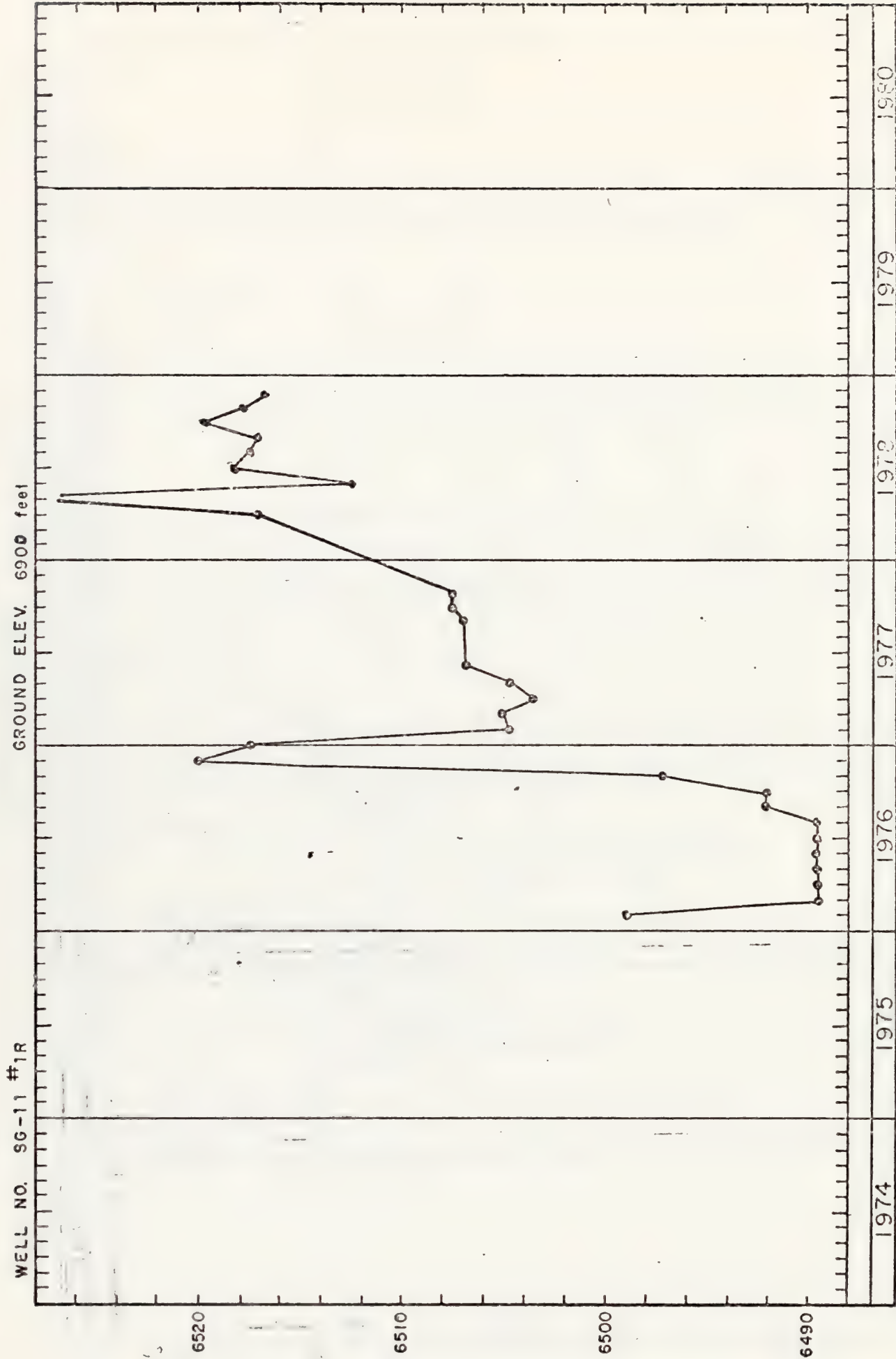


WATER LEVEL DATA





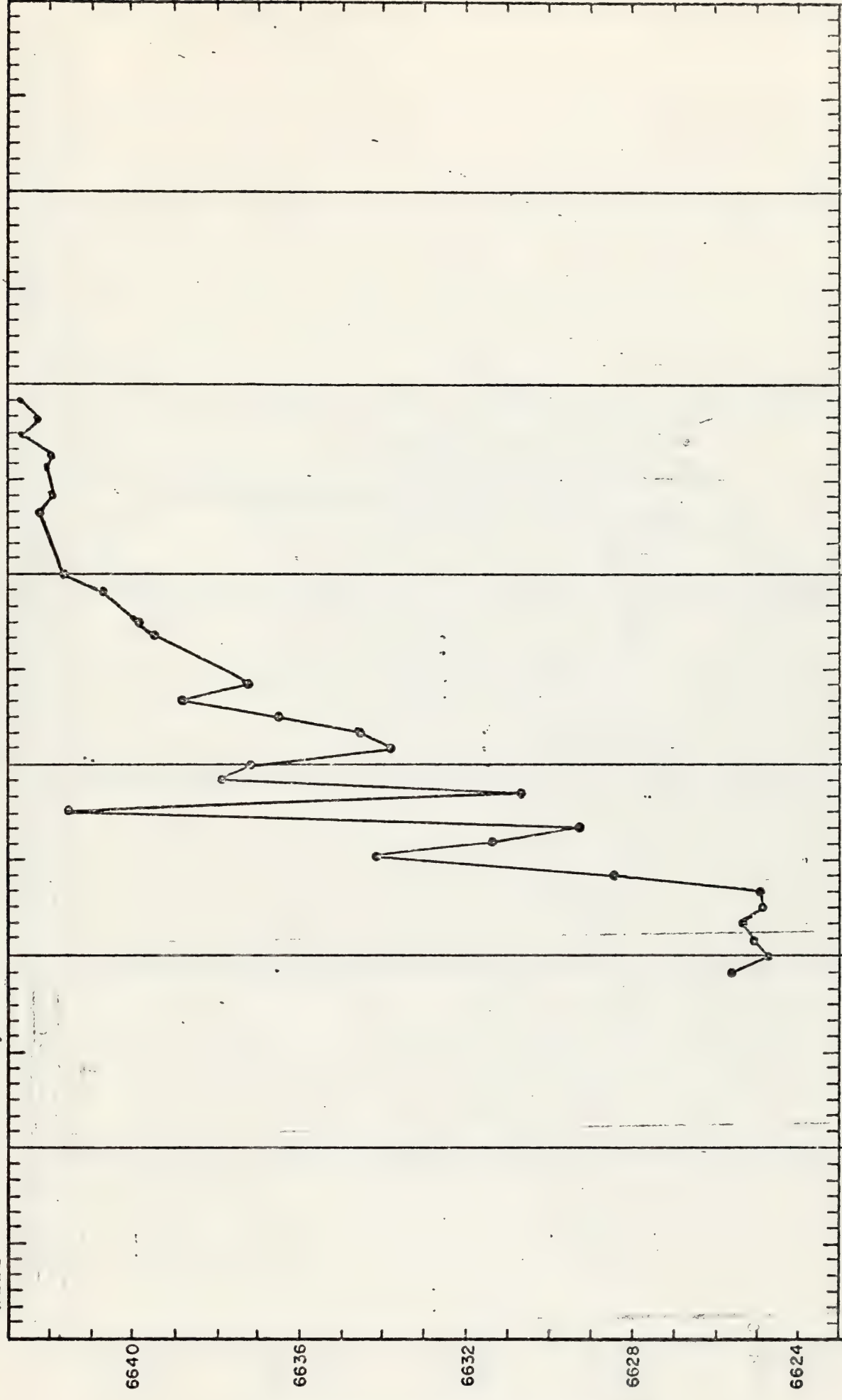
WATER LEVEL DATA



WATER LEVEL DATA

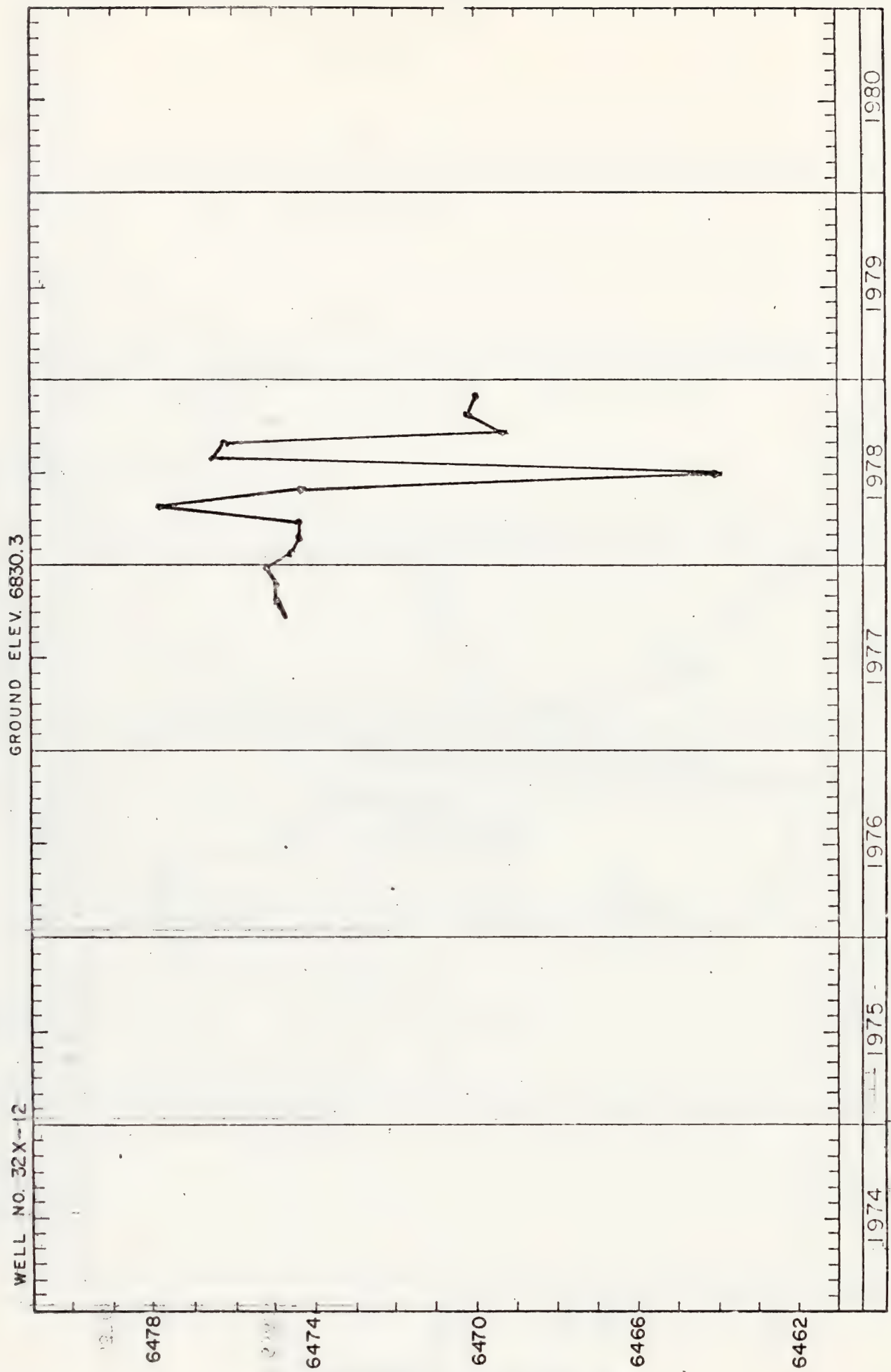
WELL NO. SG-17 - String 1R

GROUND ELEV. 6905 feet

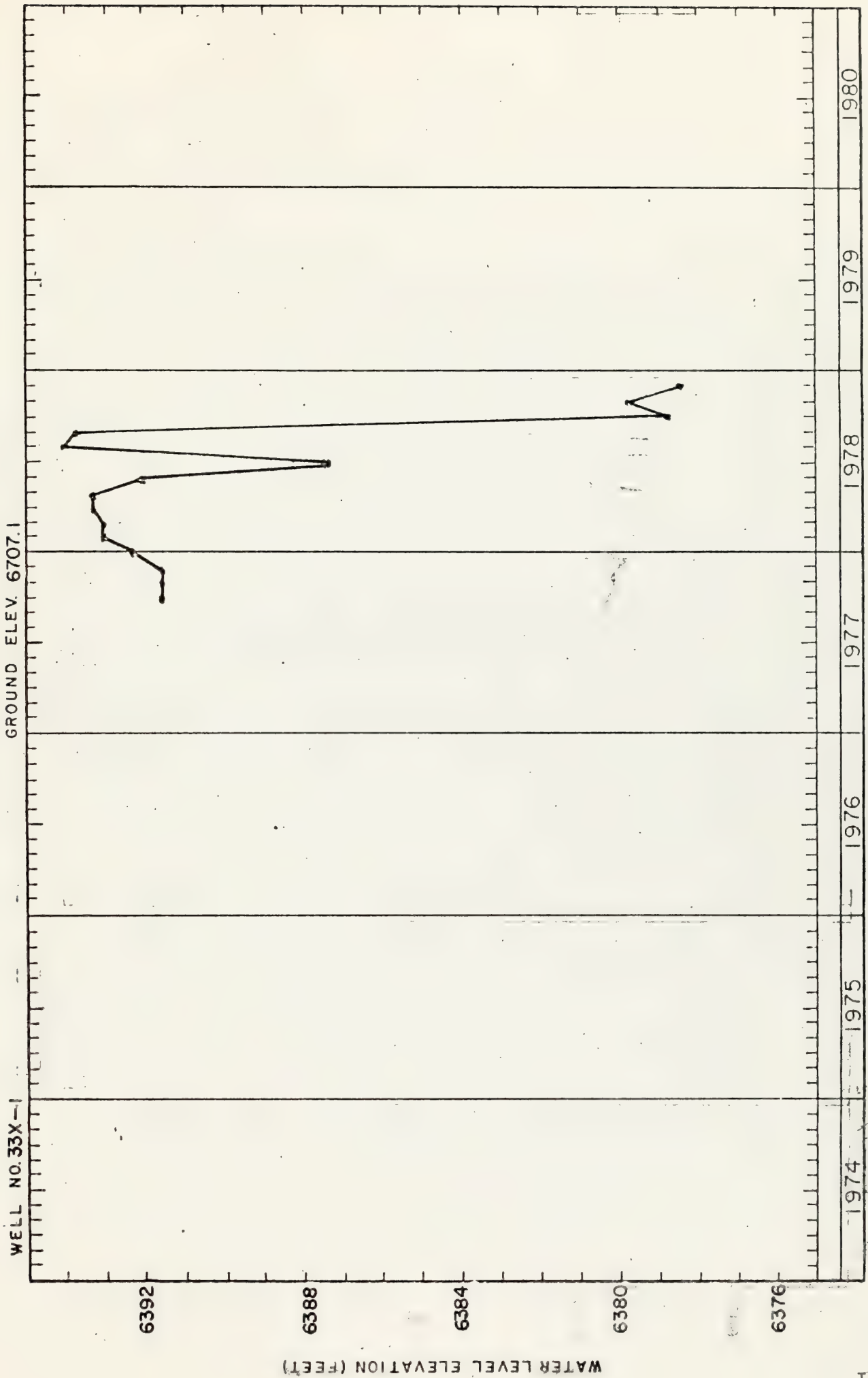


WATER LEVEL DATA





WATER LEVEL DATA



WATER LEVEL DATA

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GROUND  
WATER QUALITY

87746

40. 1. 3. 19  
1. 1. 3. 19

1. 1. 3. 19

1. 1. 3. 19

## WATER QUALITY DATA FOR GROUND WATER

- A - Alluvial Wells
- B - Upper Aquifer Wells
- C - Lower Aquifer Wells

Water quality data were collected in the first three quarters of 1978. Water quality data are reported in Tables II A-6 through II A-8.

<u>Table/Figure No.</u>	<u>Description</u>	<u>Page No.</u>
Table II A-6	Water Quality Parameters - Alluvial Wells ( 4 Pages)	II A-355
Table II A-7	Water Quality Parameters - Upper Aquifer ( 4 Pages)	II A-359
Table II A-8	Water Quality Parameters - Lower Aquifer ( 4 Pages)	II A-363

See Section IV for four-digit Station computer code.



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TABLE II A-6

CB-TRACT  
WATER QUALITY PARAMETERS  
ALLUVIAL WELLS  
FOR SAMPLE DATA SHOWN

WELL	YR	MO	SPEC COND (UMHOS)	PH	TOT ALK (MG/L CACO <sub>3</sub> )	HARDNESS (MG/L CACO <sub>3</sub> )	SOLUBLE SOLIDS (MG/L)	CHEM O <sub>2</sub> DEMAND (MG/L)	BOD <sub>5</sub> (MG/L)	OIL AND GREASE (MG/L)	DISS O <sub>2</sub> (MG/L)	WATER TEMP (C)
WA01	78	3	-0.1	7.5	500.0	460.0	1230.0	18.0	6.0	7.0	4.0	14.0
WA08	78	3	-0.1	8.3	480.0	530.0	970.0	20.0	4.0	10.0	5.9	16.0
		9	1200.0	7.6	430.0	530.0	1000.0	8.0	5.0	9.0	6.7	11.0
WA09	78	3	-0.1	7.9	430.0	440.0	980.0	20.0	6.0	35.0	8.8	8.0
		9	1000.0	7.6	380.0	480.0	840.0	50.0	5.0	13.0	11.2	15.0
WA10	78	3	-0.1	7.6	510.0	500.0	970.0	28.0	5.0	33.0	8.3	16.0
WA11	78	3	-0.1	7.5	490.0	630.0	1200.0	4.0	4.0	1.0	7.9	15.0
		9	1320.0	7.8	420.0	530.0	1100.0	9.0	30.0	7.0	8.5	7.8
WA12	78	3	-0.1	7.4	460.0	580.0	1400.0	16.0	6.0	6.0	6.2	15.0
		9	1400.0	7.7	510.0	580.0	1200.0	2.0	4.0	16.0	7.3	16.0

NOTE: -0.1 INDICATES NOT SAMPLED

REFER TO TABLE IV A-1 FOR LOCATION CODES

CB-TRACT  
WATER QUALITY PARAMETERS  
ALLUVIAL WELLS  
FOR SAMPLE DATE SHOWN

WELL	YR	MO	MG (MG/L)	NO <sub>3</sub> (MG/L)	K (MG/L)	NA (MG/L)	SO <sub>4</sub> (MG/L)	HCO <sub>3</sub> (MG/L) CACO <sub>3</sub>	CA (MG/L)	CO <sub>3</sub> (MG/L) CACO <sub>3</sub>	CL (MG/L)	LI (MG/L)	AL (MG/L)	AS (MG/L)	BA (MG/L)
WA01	78	3	86.0	.60	2.0	220.0	140.0	500.0	82.0	.9	18.0	.02	3.000	.010	.40
WA08	78	3	78.0	6.00	2.0	88.0	440.0	475.0	95.0	8.0	6.0	.01	.200	.010	.40
		9	80.0	3.10	1.8	130.0	410.0	430.0	83.0	.9	7.0	.01	.050	.010	.40
WA09	78	3	72.0	6.00	.9	99.0	410.0	430.0	64.0	.9	6.0	.02	.100	.010	.40
		9	66.0	4.90	.8	100.0	140.0	380.0	77.0	.9	6.0	.01	.700	.010	.50
WA10	78	3	79.0	4.00	2.0	120.0	350.0	510.0	110.0	.9	6.0	.01	.100	.010	.40
WA11	78	3	96.0	4.00	2.0	130.0	320.0	490.0	88.0	.9	9.0	.02	.040	.010	.40
		9	94.0	1.80	1.8	150.0	430.0	420.0	80.0	.9	8.0	.01	.090	.010	.40
WA12	78	3	97.0	3.00	2.0	130.0	440.0	460.0	110.0	.9	9.0	.02	.200	.010	.40
		9	94.0	1.80	1.7	140.0	420.0	510.0	95.0	.9	8.0	.01	.200	.010	.70

NOTE: -.1 INDICATES NOT SAMPLED

REFER TO TABLE IV A-1 FOR LOCATION CODES



CB-TRACT  
WATER QUALITY PARAMETERS  
ALLUVIAL WELLS  
FOR SAMPLE DATE SHOWN

WELL	YR	MO	B (MG/L)	CD (MG/L)	CR (MG/L)	CU (MG/L)	F (MG/L)	FE (MG/L)	PB (MG/L)	MN (MG/L)	NI (MG/L)	ZN (MG/L)	SR (MG/L)	AG (MG/L)	MO (MG/L)
WA01	78	3	.04	.040	.070	.010	.96	.02	.300	.400	.010	.210	4.0	.060	.100
WA08	78	9	.03 .03	.020 .010	.010 .010	.010 .010	.20 .10	.20 .40	.100 .040	.100 .010	.010 .010	.030 .040	4.0 5.0	.020 .010	.010 .080
WA09	78	9	.03 1.10	.020 .010	.020 .010	.020 .060	.20 .20	.01 .40	.100 .040	.070 .080	.010 .010	.030 .300	4.0 5.0	.080 .010	.010 .010
WA10	78	3	.04	.010	.020	.010	.30	.08	.100	.070	.010	.060	4.0	.060	.020
WA11	78	9	.04 .56	.010 .010	.010 .010	.010 .010	.20 .20	.01 .40	.100 .040	.070 .010	.010 .010	.030 .020	5.0 6.0	.040 .010	.010 .040
WA12	78	9	.09 .04	.010 .010	.010 .010	.010 .020	.20 .20	.05 .40	.100 .040	.090 .010	.010 .010	.040 .020	5.0 6.0	.080 .010	.020 .050

NOTE: -.1 INDICATES NOT SAMPLED

REFER TO TABLE IV A-1 FOR LOCATION CODES

CB-TRACT  
WATER QUALITY PARAMETERS  
ALLUVIAL WELLS  
FOR SAMPLE DATE SHOWN

WELL	YR	MO	PHEN (MG/L)	NH3 (MG/L)	BR (MG/L)
WA01	78	3	.0020	.170	.090
WA08	78	3	.1000	.030	.600
		9	.0030	3.800	.700
WA09	78	3	.1000	.030	.500
		9	.0020	.250	.600
WA10	78	3	.1000	.030	.500
WA11	78	3	.1000	.220	.600
		9	.0010	4.400	.820
WA12	78	3	.1000	.030	.600
		9	.0010	.001	.590

NOTE: -.1 INDICATES NOT SAMPLED

REFER TO TABLE IV A-1 FOR LOCATION CODES

TABLE II A-7

CB-TRACT  
WATER QUALITY PARAMETERS  
UPPER AQUIFER  
FOR SAMPLE DATA SHOWN

WELL	YR	MO	SPEC COND (UMHOS)	PH	TOT ALK (MG/L CACO <sub>3</sub> )	HARDNESS (MG/L CACO <sub>3</sub> )	SOLUBLE SOLIDS (MG/L)	CHEM O <sub>2</sub> DEMAND (MG/L)	BOD <sub>5</sub> (MG/L)	OIL AND GREASE (MG/L)	DISS O <sub>2</sub> (MG/L)	WATER TEMP (C)
WX02	78	5	1800.0	8.8	500.0	44.0	990.0	28.0	8.0	10.0	12.0	4.6
WX04	78	5	900.0	8.0	280.0	130.0	530.0	38.0	4.0	8.0	3.1	17.0
WX10	78	6	1500.0	7.1	420.0	400.0	990.0	24.0	5.0	13.0	2.4	17.0
WX12	78	5	1200.0	7.9	490.0	300.0	860.0	42.0	8.0	7.0	8.0	18.0
WX17	78	5	1700.0	8.5	840.0	50.0	1000.0	47.0	15.0	8.0	2.5	16.0
WX19	78	6	2700.0	7.9	900.0	40.0	1800.0	36.0	3.0	.1	.5	18.0
WX20	78	5	2600.0	8.1	1650.0	62.0	1900.0	4.0	8.0	3.0	.8	18.0
WX21	78	6	825.0	8.8	420.0	150.0	630.0	28.0	10.0	20.0	2.5	14.0
WX44	78	5	1400.0	7.8	410.0	410.0	750.0	24.0	10.0	4.0	3.6	19.0
WX55	78	5	1180.0	8.6	600.0	44.0	670.0	4.0	5.0	18.0	3.8	12.0
WX63	78	5	1200.0	8.6	670.0	42.0	930.0	8.0	7.0	8.0	3.7	16.5
WX92	78	5	2000.0	8.3	850.0	28.0	970.0	60.0	26.0	8.0	3.6	22.0

NOTE: -.1 INDICATES NOT SAMPLED

REFER TO TABLE IV A-1 FOR LOCATION CODES



CB-TRACT  
WATER QUALITY PARAMETERS  
UPPER AQUIFER  
FOR SAMPLE DATE SHOWN

WELL	YR	MO	MG (MG/L)	NO3 (MG/L)	K (MG/L)	NA (MG/L)	SO4 (MG/L)	HCO3 (MG/L) CACO3	CA (MG/L)	CO3 (MG/L) CACO3	CL (MG/L)	LI (MG/L)	AL (MG/L)	AS (MG/L)	BA (MG/L)
WX02	78	5	5.0	5.00	1.2	390.0	240.0	460.0	18.0	40.0	16.0	.08	.400	.010	.50
WX04	78	5	2.0	2.00	.9	180.0	130.0	260.0	6.0	20.0	8.0	.04	.200	.010	.40
WX10	78	6	36.0	3.00	.9	1500.0	360.0	400.0	54.0	20.0	8.0	.07	.100	.010	.40
WX12	78	5	10.0	5.00	.1	360.0	190.0	490.0	34.0	.9	6.0	.07	.100	.100	.40
WX17	78	5	5.0	4.00	1.2	2200.0	110.0	760.0	6.0	80.0	14.0	.07	.300	.010	.40
WX19	78	6	2.0	4.00	1.0	2300.0	82.0	820.0	4.0	80.0	14.0	.10	.100	.010	1.00
WX20	78	5	2.0	6.00	.1	2000.0	8.0	1420.0	7.0	230.0	16.0	.10	.100	.100	1.00
WX21	78	6	15.0	4.00	.5	2000.0	28.0	340.0	16.0	80.0	4.0	.04	.200	.010	.40
WX44	78	5	14.0	11.00	1.0	200.0	170.0	370.0	57.0	40.0	12.0	.07	.700	.010	.50
WX55	78	5	6.0	5.00	1.8	320.0	8.2	580.0	16.0	20.0	7.0	.06	.300	.010	6.00
WX63	78	5	4.0	5.00	2.6	350.0	220.0	630.0	5.9	40.0	12.0	.07	.300	.010	6.00
WX92	78	5	41.0	5.00	.2	400.0	110.0	760.0	6.0	90.0	7.0	.10	.500	.010	.70

NOTE: -.1 INDICATES NOT SAMPLED

REFER TO TABLE IV A-1 FOR LOCATION CODES

CB-TRACT  
WATER QUALITY PARAMETERS  
UPPER AQUIFER  
FOR SAMPLE DATE SHOWN

WELL	YR	MO	B (MG/L)	CD (MG/L)	CR (MG/L)	CU (MG/L)	F (MG/L)	FE (MG/L)	PB (MG/L)	MN (MG/L)	NI (MG/L)	ZN (MG/L)	SR (MG/L)	AG (MG/L)	MO (MG/L)
WX02	78	5	.09	.010	.010	.010	1.70	.10	.090	.040	.090	.900	2.0	.010	.090
WX04	78	5	.04	.010	.090	.100	.95	4.00	.090	.100	.090	.900	7.0	.020	.090
WX10	78	6	.04	.010	.090	.100	.55	4.00	.090	.100	.090	.090	11.0	.040	.090
WX12	78	5	.20	.010	.090	.100	3.20	4.00	.090	.100	.090	.900	10.0	.010	.090
WX17	78	5	1.00	.010	.090	.100	20.00	4.00	.200	.100	.090	.900	1.0	.010	.090
WX19	78	6	1.00	.010	.090	.100	25.00	4.00	.090	.100	.090	.090	2.0	.020	.200
WX20	78	5	1.00	.010	.090	.100	24.00	4.00	.090	.100	.100	.090	2.0	.080	.200
WX21	78	6	.20	.010	.090	.100	9.40	4.00	.090	.100	.090	.090	5.0	.100	.090
WX44	78	5	.09	.010	.010	.010	3.20	.10	.200	.060	.090	.900	9.0	.010	.090
WX55	78	5	.60	.010	.010	.100	18.00	4.00	.090	.030	.090	.900	3.0	.010	.090
WX63	78	5	.40	.010	.010	.010	18.30	.20	.090	.010	.090	.900	2.0	.010	.200
WX92	78	5	1.00	.010	.090	.100	21.00	9.00	.090	.100	.090	.900	2.0	.040	.200

NOTE: -.1 INDICATES NOT SAMPLED

REFER TO TABLE IV A-1 FOR LOCATION CODES

CB-TRACT  
WATER QUALITY PARAMETERS  
UPPER AQUIFER  
FOR SAMPLE DATE SHOWN

WELL	YR	MO	PHEN (MG/L)	NH3 (MG/L)	BR (MG/L)
WX02	78	5	.0020	.710	.090
WX04	78	5	.0010	.030	.090
WX10	78	6	.0040	.300	.300
WX12	78	5	.0010	3.340	.300
WX17	78	5	.0010	2.360	.090
WX19	78	6	.0720	1.680	.090
WX20	78	5	.0060	1.380	.090
WX21	78	6	.1380	.300	.400
WX44	78	5	.0010	-.100	.090
WX55	78	5	.0020	.960	.090
WX63	78	5	.0030	.900	.090
WX92	78	5	.0020	1.250	.090

NOTE: -.1 INDICATES NOT SAMPLED

REFER TO TABLE IV A-1 FOR LOCATION CODES



TABLE II A-8

CB-TRACT  
WATER QUALITY PARAMETERS  
LOWER AQUIFER  
FOR SAMPLE DATA SHOWN

WELL	YR	MO	SPEC COND (UMHOS)	PH	TOT ALK (MG/L CACO <sub>3</sub> )	HARDNESS (MG/L CACO <sub>3</sub> )	SOLUBLE SOLIDS (MG/L)	CHEM O <sub>2</sub> DEMAND (MG/L)	BOD <sub>5</sub> (MG/L)	OIL AND GREASE (MG/L)	DISS O <sub>2</sub> (MG/L)	WATER TEMP (C)
WY01	78	5	7000.0	8.1	3100.0	26.0	3400.0	42.0	40.0	16.0	3.9	18.0
WY12	78	5	8000.0	7.6	490.0	62.0	6300.0	32.0	14.0	11.0	2.5	16.0
WY17	78	5	4500.0	7.9	2200.0	46.0	3000.0	36.0	15.0	.9	3.4	20.0
WY46	78	5	1150.0	8.2	650.0	60.0	720.0	44.0	10.0	6.0	3.3	18.0
WY51	78	5	6000.0	7.9	2400.0	56.0	340.0	8.0	6.0	18.0	4.3	21.0
WY54	78	5	2000.0	7.8	1120.0	90.0	1500.0	150.0	6.0	15.0	.9	17.0
WY81	78	5	1850.0	8.1	13.0	34.0	1200.0	10.0	8.0	21.0	2.4	15.0

NOTE: -.1 INDICATES NOT SAMPLED

REFER TO TABLE IV A-1 FOR LOCATION CODES

CB-TRACT  
WATER QUALITY PARAMETERS  
LOWER AQUIFER  
FOR SAMPLE DATE SHOWN

WELL	YR	MO	MG (MG/L)	NO <sub>3</sub> (MG/L)	K (MG/L)	NA (MG/L)	SO <sub>4</sub> (MG/L)	HCO <sub>3</sub> (MG/L) CACO <sub>3</sub>	CA (MG/L)	CO <sub>3</sub> (MG/L) CACO <sub>3</sub>	CL (MG/L)	LI (MG/L)	AL (MG/L)	AS (MG/L)	BA (MG/L)
WY01	78	5	2.0	6.00	.4	3400.0	86.0	2400.0	5.5	700.0	28.0	.03	.300	.010	1.00
WY12	78	5	3.0	9.00	.8	3200.0	140.0	490.0	11.0	.9	720.0	5.00	.500	.020	.40
WY17	78	5	2.0	15.00	.5	2700.0	70.0	1800.0	10.0	400.0	300.0	1.00	.200	.010	3.00
WY46	78	5	5.0	6.30	4.0	340.0	320.0	600.0	8.9	50.0	10.0	.05	.400	.010	.70
WY51	78	5	5.0	11.00	8.6	1500.0	4.0	2400.0	12.0	.9	590.0	4.00	.500	.010	.40
WY54	78	5	13.0	5.40	9.0	530.0	8.2	1070.0	40.0	50.0	94.0	.60	.100	.010	.40
WY81	78	5	2.0	4.00	.1	2400.0	66.0	13.0	5.0	.9	8.0	.10	.300	.010	1.00

NOTE: -.1 INDICATES NOT SAMPLED

REFER TO TABLE IV A-1 FOR LOCATION CODES

CB-TRACT  
WATER QUALITY PARAMETERS  
LOWER AQUIFER  
FOR SAMPLE DATE SHOWN

WELL	YR	MO	B (MG/L)	CD (MG/L)	CR (MG/L)	CU (MG/L)	F (MG/L)	FE (MG/L)	PB (MG/L)	MN (MG/L)	NI (MG/L)	ZN (MG/L)	SR (MG/L)	AG (MG/L)	MO (MG/L)
WY01	78	5	9.00	.010	.090	.100	32.00	4.00	.090	.100	.090	.090	.8	.060	.200
WY12	78	5	30.00	.010	.090	.100	30.00	4.00	.090	.100	.090	.900	1.0	.100	.200
WY17	78	5	10.00	.010	.090	.100	23.00	4.00	.200	.100	.090	.090	2.0	.010	.090
WY46	78	5	.40	.010	.010	.010	18.70	.10	.200	.040	.900	.900	3.0	.010	.090
WY51	78	5	21.00	.010	.010	.100	22.00	4.00	.600	.050	.090	.900	3.0	.010	.100
WY54	78	5	3.00	.010	.010	.100	9.60	4.00	.200	.010	.090	.900	3.0	.010	.090
WY81	78	5	.70	.010	.100	.100	24.00	4.00	.090	.100	.090	.090	3.0	.020	.300

NOTE: -.1 INDICATES NOT SAMPLED

REFER TO TABLE IV A-1 FOR LOCATION CODES



C: TRACT  
WATER QUALITY PARAMETERS  
LOWER AQUIFER  
FOR SAMPLE DATE SHOWN

WELL	YR	MO	PHEN (MG/L)	NH <sub>3</sub> (MG/L)	BR (MG/L)
WY01	78	5	.0040	2.830	.090
WY12	78	5	.0010	3.860	.090
WY17	78	5	.0010	6.550	.090
WY46	78	5	.0010	1.100	.090
WY51	78	5	.0010	9.180	.090
WY54	78	5	.0020	1.420	.190
WY81	78	5	.0010	1.100	.090

NOTE: -.1 INDICATES NOT SAMPLED

REFER TO TABLE IV A-1 FOR LOCATION CODES







## II B AIR QUALITY

The Air Quality Program during the Development Monitoring Phase is concerned with background measurements of atmospheric gaseous constituents and with meteorological processes which affect transport and diffusion. Noise is also included in this chapter to be consistent with past reports although it is a separate discipline in the Development Monitoring Plan.

Figure II B-1 shows the location of the air quality network which includes the following:

- . One air quality trailer at Station 020 that resumed operation in July, 1978.
- . One air quality trailer at Station 023 that has been in continuous operation since September, 1974 (prior to the two-year Baseline Program).
- . Sixty meter meteorological tower at Station 023 which also has been in continuous operation since September, 1974.
- . Weighing-bucket rain gauges at Stations 020 and 023.
- . In a cooperative program with the EPA, pibal launches, twice per day, every other day, have been made at Station 024 since October, 1977.
- . A continuously recording acoustic radar instrument has been in operation since October, 1977 at Station 020.
- . Mechanical weather stations coupled with hi-vol particulates samples have been in operation since February, 1978 at Stations 042 and 056.

Measurements taken are summarized in Table II B-1.

References 1-12 contain all the above basic data.

Location of visibility and noise stations are shown in their respective sub-sections.

See Section IV for four-digit Station computer codes.

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**LEGEND**

- ▲ Weighing-Bucket Rain Gauge
- Air Quality Trailer
- ⬢ 60-M. Meteorological Tower
- Weather Station & Particulate Sample
- ▼ Acoustic Radar
- ◆ Pibal Launch Site

**AIR QUALITY AND METEOROLOGICAL  
STATION LOCATIONS**

Figure II B-1



Table II B-1

AIR QUALITY AND METEOROLOGICAL MEASUREMENTS

<u>Station 020</u>	<u>Sampling Frequency</u>	<u>Minimum Reporting Frequency</u>
NO	5 Sec	1 Hr Avg
NO <sub>x</sub>	5 Sec	1 Hr Avg
NO <sub>2</sub>	NO <sub>x</sub> -NO	1 Hr Avg
O <sub>3</sub>	5 Sec	1 Hr Avg
Wind Speed	5 Sec	1 HR Avg
Wind Direction	5 Sec	1 Hr Avg
Temperature	5 Sec	1 Hr Avg
Particulate	24 Hr every 3 Days	24 Hr Total
Precipitation	Continuous	1 Hr Total
<u>Station 023</u>		
Trailer: NO	5 Sec	1 Hr Avg
NO <sub>x</sub>	5 Sec	1 Hr Avg
NO <sub>2</sub>	NO <sub>x</sub> -NO	1 Hr Avg
O <sub>3</sub>	5 Sec	1 Hr Avg
SO <sub>2</sub>	5 Sec	1 Hr Avg
H <sub>2</sub> S	5 Sec	1 Hr Avg
THC	5 Sec	1 Hr Avg
CH <sub>4</sub>	5 Sec	1 Hr Avg
NMHC	5 Sec	1 Hr Avg
CO	5 Sec	1 Hr Avg
Baro. Press.	5 Sec	1 Hr Avg
Solar Radiation	5 Sec	1 Hr Avg
Relative Humidity	Continuous	1 Hr
Particulates	24 Hr every 3 Days	24 Hr Total
Precipitation	Continuous	1 Hr Total
Tower: (@ 10m, 30m, 60m)		
Wind speed	5 Sec	1 Hr Avg
Wind Direction	5 Sec	1 Hr Avg
Temperature (10m)	5 Sec	1 Hr Avg
Hor. Wind Dir. 60m	5 Sec	1 Hr Avg
Delta Temp 60-10m	5 Sec	1 Hr Avg
<u>Stations 042, 056</u>		
Wind Speed	Continuous	1 Hr
Wind Direction	Continuous	1 Hr
Temperature	Continuous	1 Hr
Particulate	24 Hr. every 3 Days	24 Hr Total
<u>Acoustic Radar (Sta. 020)</u>		
Inversion Height	Continuous	1 Hr Avg
Mixing Height	Continuous	1 Hr Avg
<u>Pibal Launches (Sta. 024)</u>		
Wind Speed	30 Sec	30 Sec
Wind Direction	30 Sec	30 Sec
Temperature	Continuous	30 Sec







## II B-1 AIR QUALITY AND SURFACE METEOROLOGY

Air Quality Stations 020 and 023, the precipitation gauges at Stations 020 and 023, the MRI Mechanical Weather Station and hi-vol samplers were utilized to provide air quality and surface meteorological data. References 1-12 containing basic data through September, 1978, are included at the end of the air quality section.

<u>Table/Figure No.</u>	<u>Description</u>	<u>Page No.</u>
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Table II B-3	Cross Index to Correction Tables (8 pages)	II B-8
Table II B-4	Quarterly summary for Trailer 020. This table summarizes air quality data for the quarter June-August 1978.	II B-16
	Quarterly summary for Trailer 023. This table summarizes air quality data for the quarter.	
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	<u>Maximum Concentrations</u>	
Table II B-9	1 hour, 3 hour, and 24 hour Maximum Concentrations, SO <sub>2</sub> , Trailer 023	II B-21
Table II B-10	1 hour Maximum Concentrations, H <sub>2</sub> S, Trailer 023	II B-22
Table II B-11	24 hour Maximum Concentration, Particulates, Trailer 020	II B-23
Table II B-12	24 hour Maximum Concentration, Particulates, Trailer 023	II B-24
Table II B-13	1 hour and 8 hour Maximum Concentrations, CO, Trailer 023	II B-25
Table II B-14	1 hour Maximum Concentration, NO <sub>x</sub> , Trailer 020	II B-26
Table II B-15	1 hour Maximum Concentration, NO <sub>x</sub> , Trailer 023	II B-27
Table II B-16	1 hour Maximum Concentration, NO, Trailer 020	II B-28
Table II B-17	1 hour Maximum Concentration, NO, Trailer 023	II B-29
Table II B-18	1 hour Maximum Concentration, NO <sub>2</sub> , Trailer 020	II B-30
Table II B-19	1 hour Maximum Concentration, NO <sub>2</sub> , Trailer 023	II B-31
Table II B-20	1 hour Maximum Concentration, O <sub>3</sub> , Trailer 023	II B-32

<u>Table/Figure No.</u>	<u>Maximum Concentrations (cont.)</u>	<u>Page No.</u>
Table II B-21	1 hour Maximum Concentration, O <sub>3</sub> , Trailer 023	II B-33
Table II B-22	Monthly Arithmetic Ambient Air Constituent Concentrations of Gases and Particulates, Trailer 023.	II B-34
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Table II B-23	February, 1978. (4 pages)	II B-35
Table II B-24	March, 1978. (10 pages)	II B-39
Table II B-25	April, 1978. (10 pages)	II B-49
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Table II B-27	June, 1978. (10 pages)	II B-69
Table II B-28	July, 1978. (10 pages)	II B-79
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<u>Meteorological Summary</u>		
Table II B-31	Vector Monthly Averages for Winds, Trailer 023	II B-109
Table II B-32	Wind Speed and Direction	II B-110
	Frequency Tables of Wind Speed by Direction at 10 meter height at Trailer 020 and at 10 meter, 30 meter, and 60 meter heights at Trailer 023. Tables are included only when data were collected during the month.	
Table II B-33	February, 1978. (3 pages)	II B-111
Table II B-34	March, 1978. (3 pages)	II B-114
Table II B-35	April, 1978. (4 pages)	II B-117
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Table II B-37	June, 1978. (4 pages)	II B-123
Table II B-38	July, 1978. (4 pages)	II B-127
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Table II B-2

Malfunction Codes

<u>Numerical Entry Code</u>	<u>Letter Code</u>	<u>Description</u>
9000	CA	Calibration ( calibration, system check )
9100	MT	Maintenance ( changing paper, tape, charcoal )
9200	FO	Flame Out ( on the GC-THC, HC, CH <sub>4</sub> , CO )
9300	IM	Instrument Malfunction ( instrument failures )
9400	PF	Power Failure ( generator failure )
9500	RF	Recording System Failure ( chart jams, runs out )
9550	NV	Not Visible ( values were not within range of instrument i. e. inversion heights may exist beyond the full scale of the Acoustic Radar )
9600	LI	Local Interference ( car nearby )
9650	OE	Operator Error ( Field tech leaves switch in wrong position )
9700	OS	Off Scale ( at top of chart )
9750	IN	Interference ( CO <sub>2</sub> interference on sulfur data, SO <sub>2</sub> interference in oxidant readings )
9800	SE	Special Experiment
9850	OR	Out for Repair ( instrument removed from site with no replacement )
9900	VA	Variable Wind Direction
9950	CM	Calm ( no wind direction when wind speed = 0 )
9980	UN	Unlimited Ceiling ( reported by NWS Stations )
9900		Blank ( causes a space to be printed as in the beginning of a new month before a component starts )
8000	TR	Trace of Precipitation



## CROSS INDEX TO CORRECTIONS, AEROVIRONMENT REPORTS

## DIURNAL VARIATION OF GASES, PARTICULATES, AND METEOROLOGICAL DATA

Semi Annual Report Con- taining Correction	* Page No.	Interim Monitoring Report Containing Incorrect Data	Page No.	Station No.	Year	Month	Constituent Identification
1/II B-1911		2/II B-171		023	77	Sept.	Total Hydrocarbons
1/II B-1912		2/II B-173		023	77	Sept.	Hydrocarbons less Methane
1/II B-1913		2/II B-172		023	77	Sept.	Methane
1/II B-1914		2/II B-174		023	77	Sept.	Carbon Monoxide
1/II B-1922		2/II B-277		023	77	Oct.	Total Hydrocarbons
1/II B-1923		2/II B-279		023	77	Oct.	Hydrocarbons less Methane
1/II B-1924		2/II B-278		023	77	Oct.	Methane
1/II B-1925		2/II B-280		023	77	Oct.	Carbon Monoxide
1/II B-1933		2/II B-379		023	77	Nov.	Delta T #2
1/II B-1947		2/II B-567		023	77	Dec.	Delta T #2
1/II B-1961		2/II B-779		023	77	Jan.	Barometric Pressure
1/II B-1962		2/II B-777		023	78	Jan.	Delta T #2
* Development Monitoring Report Number 1.							

## CROSS-INDEX TO CORRECTIONS TO TABLE - AEROVIRONMENT REPORTS

## DOWNTIME HOURS AND PERCENT EFFICIENCY REPORT

Semi Annual Report Con- taining Correction	Page No.	Interim Monitoring Report Containing Incorrect Data	Page No.	Station No.	Year	Month	Constituent Identification
1/II B-1916		2/II B-198		023	1977	Sept.	Part, RH1, SOLR, SO2, STH2, STH3, STH4, TEM2, TFM3, TEM4, THC, WD2, WD3, WD4, WS2, WS3, WS4
1/II B-1917		2/II B-197		023	1977	Sept.	BARP, BHD1, BHD3, BHP1, BSP3, BST1, BST3, BVD1, BVD3, BWS1, BWS3, CH4, CO, DT2, H2S, NO, NOX, 03
1/II B-1932		2/II B-304		023	1977	October	BARP, BHD1, BHD3, BHP1, BSP3, BST1, BST3, BVD1, BVD3, BWS1, BWS3, BWS3, CH4, CO, DT2, H2S, NO, NOX, 03
1/II B-1931		2/II B-305		023	1977	October	Part, RH1, SOLR, SO2, STH2, STH3, STH4, TEM2, TEM3, TEM4, THC, WD2, WD3, WD4, WS2, WS3, WS4

## CROSS-INDEX TO CORRECTIONS TO TABLE-AEROVIRONMENT REPORTS

## STABILITY CLASS REPORT

Semi Annual Report Con- taining Correction	Page No.	Interim Monitoring Report Containing Incorrect Data	Page No.	Station No.	Year	Month	Constituent Identification
1/II B-1934		2/II B-493		023	77	Nov.	Clock Hour
1/II B-1935		2/II B-494		023	77	Nov.	Hourly Wind Speed and Direction for Stability Class A
1/II B-1936		2/II B-495		023	77	Nov.	Hourly Wind Speed and Direction for Stability Class A
1/II B-1937		2/II B-496		023	77	Nov.	Hourly Wind Speed and Direction for Stability Class B
1/II B-1938		2/II B-497		023	77	Nov.	Hourly Wind Speed and Direction for Stability Class B
1/II B-1939		2/II B-498		023	77	Nov.	Hourly Wind Speed and Direction for Stability Class C
1/II B-1940		2/II B-499		023	77	Nov.	Hourly Wind Speed and Direction for Stability Class C
1/II B-1941		2/II B-500		023	77	Nov.	Hourly Wind Speed and Direction for Stability Class D
1/II B-1942		2/II B-501		023	77	Nov.	Hourly Wind Speed and Direction for Stability Class D
1/II B-1943		2/II B-502		023	77	Nov.	Hourly Wind Speed and Direction for Stability Class E
1/II B-1944		2/II B-503		023	77	Nov.	Hourly Wind Speed and Direction for Stability Class E



## CROSS-INDEX TO CORRECTIONS TO TABLE-AEROVIRONMENT REPORTS

## STABILITY CLASS REPORT

(CONTINUED)

Semi Annual Report Con- taining Corrections	Page No.	Interim Monitoring Report Containing Incorrect Data	Page No.	Station No.	Year	Month	Constituent Identification
1/II B-1945		2/II B-504		023	77	Nov.	Hourly Wind Speed and Direction for Stability Class F
1/II B-1946		2/II B-505		023	77	Nov.	Hourly Wind Speed and Direction for Stability Class F
1/II B-1948		2/II B-703		023	77	Dec.	Clock Hour
1/II B-1949		2/II B-704		023	77	Dec.	Hourly Wind Speed and Direction for Stability Class A
1/II B-1950		2/II B-705		023	77	Dec.	Hourly Wind Speed and Direction for Stability Class A
1/II B-1951		2/II B-706		023	77	Dec.	Hourly Wind Speed and Direction for Stability Class B
1/II B-1952		2/II B-707		023	77	Dec.	Hourly Wind Speed and Direction for Stability Class B
1/II B-1953		2/II B-708		023	77	Dec.	Hourly Wind Speed and Direction for Stability Class C
1/II B-1954		2/II B-709		023	77	Dec.	Hourly Wind Speed and Direction for Stability Class C
1/II B-1955		2/II B-710		023	77	Dec.	Hourly Wind Speed and Direction for Stability Class D
1/II B-1956		2/II B-711		023	77	Dec.	Hourly Wind Speed and Direction for Stability Class D

## CROSS-INDEX TO CORRECTIONS TO TABLE-AEROVIRONMENT REPORTS

## STABILITY CLASS REPORT

(CONTINUED)

Semi Annual Report Con- taining Correction	Page No.	Interim Monitoring Report Containing Incorrect Data	Page No.	Station No.	Year	Month	Constituent Identification
1/II B-1957		2/II B-712		023	77	Dec.	Hourly Wind Speed and Direction for Stability Class E
1/II B-1958		2/II B-713		023	77	Dec.	Hourly Wind Speed and Direction for Stability Class E
1/II B-1959		2/II B-714		023	77	Dec.	Hourly Wind Speed and Direction for Stability Class F
1/II B-1960		2/II B-715		023	77	Dec.	Hourly Wind Speed and Direction for Stability Class F
1/II B-1967		2/II B-923		023	78	Jan.	Clock Hour
1/II B-1968		2/II B-924		023	78	Jan.	Hourly Wind Speed and Direction for Stability Class A
1/II B-1969		2/II B-925		023	78	Jan.	Hourly Wind Speed and Direction for Stability Class A
1/II B-1970		2/II B-926		023	78	Jan.	Hourly Wind Speed and Direction for Stability Class B
1/II B-1971		2/II B-927		023	78	Jan.	Hourly Wind Speed and Direction for Stability Class B
1/II B-1972		2/II B-928		023	78	Jan.	Hourly Wind Speed and Direction for Stability Class C
1/II B-1973		2/II B-929		023	78	Jan.	Hourly Wind Speed and Direction for Stability Class C

## CROSS-INDEX TO CORRECTIONS TO TABLE-AEROVIRONMENT REPORTS

## STABILITY CLASS REPORT

(CONTINUED)

Semi Annual Report Con- taining Correction	Page No.	Interim Monitoring Report Containing Incorrect Data	Page No.	Station No.	Year	Month	Constituent Identification
1/II B-1974		2/II B-930		023	78	Jan.	Hourly Wind Speed and Direction for Stability Class D
1/II B-1975		2/II B-931		023	78	Jan.	Hourly Wind Speed and Direction for Stability Class D
1/II B-1976		2/II B-932		023	78	Jan.	Hourly Wind Speed and Direction for Stability Class E
1/II B-1977		2/II B-933		023	78	Jan.	Hourly Wind Speed and Direction for Stability Class E
1/II B-1978		2/II B-934		023	78	Jan.	Hourly Wind Speed and Direction for Stability Class F
1/II B-1979		2/II B-935		023	78	Jan.	Hourly Wind Speed and Direction for Stability Class F



## CROSS-INDEX TO CORRECTIONS TO TABLE - AEROVIRONMENT REPORTS

## THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGE

Semi Annual Report Con- taining Correction	Page No.	Interim Monitoring Report Containing Incorrect Data	Page No.	Station No.	Year	Month	Constituent Identification
1/II B-1915		2/II B-212		023	1977	Sept.	Carbon Monoxide, Particulates, Hydro- carbons less Methane
1/II B-1926		2/II B-319		023	1977	October	Carbon Monoxide, Particulates, Hydro- carbons less Methane

## CROSS-INDEX TO CORRECTIONS TO TABLE - AEROVIRONMENT REPORTS

## DAILY AVERAGES SUMMARY REPORT

Semi Annual Report Con- ing Correction	Page No.	Interim Monitoring Report Containing Incorrect Data	Page No.	Station No.	Year	Month	Constituent Identification
1/II B-1918		2/II B-216		023	1977	Sept.	BST1, BST3, BSP1, BSP3, STH2, STH3, STH4
1/II B-1920		2/II B-215		023	1977	Sept.	WS2, WD2, WS3, WD3, WS4, WD4, BWS1, BHD1, BVD1, BWS3, BHD3, BVD1
1/II B-1921		2/II B-214		023	1977	Sept.	NOX, NO2, NO, SO2, H2S, O3, THC, HC, CH4, CO
1/II B-1919		2/II B-217		023	1977	Sept.	TEM2, TEM3, TEM4, RH1, BARP, SOLR, DT2
1/II B-1928		2/II B-321		023	1977	October	NOX, NO2, NO, SO2, H2S, O3, THC, HC, CH4, CO
1/II B-1927		2/II B-322		023	1977	October	WS2, WD2, WS3, WD3, WS4, WD4, BWS1, BHD1, BVD1, BWS3, BHD3, BVD3
1/II B-1930		2/II B-323		023	1977	October	BST1, BST3, BSP1, BSP3, STH2, STH3, STH4
1/II B-1929		2/II B-324		023	1977	October	TEM2, TEM3, TEM4, RH1, BARP, SOLR, DT2
1/II B-1966		2/II B-939		023	1978	Jan.	TEM2, TEM3, TEM4, RH1, BARP, SOLR, DT2
1/II B-1964		2/II B-940		023	1978	Jan.	BST1, BST3, BSP1, BSP3, STH2, STH3, STH4
1/II B-1963		2/II B-941		023	1978	Jan.	WS2, WD2, WS3, WD3, WS4, WD4, BWS1, BHD1, BVD1, BWS3, BHD3, BVD3
1/II B-1965		2/II B-942		023	1978	Jan.	NOX, NO2, NO, SO2, H2S, O3, THC, HC, CH4, CO

Table II B-4

QUARTERLY SUMMARY (JUNE 1978 - AUGUST 1978)  
 ( $\mu\text{g}/\text{m}^3$ )  
 STATION 020

PARAMETER	AVERAGE	MAXIMUM 24 HOUR VALUE TIME	MAXIMUM 8 HOUR VALUE TIME	MAXIMUM 3 HOUR VALUE TIME	MAXIMUM 1 HOUR VALUE TIME
Particulate *	19.7	33.7 7/26/78			
O <sub>3</sub>	42.				157.0 7/11/78 1100-1200
NO <sub>x</sub>	0 **				45.0 7/20/78 0400-0500
NO	0 **				29.0 7/20/78 0400-0500
NO <sub>2</sub>	0 **				19.0 7/31/78 0900-1000

\* Geometric

\*\* - Rounded Average



Table II B-5

QUARTERLY SUMMARY (SEPTEMBER 1977 - NOVEMBER 1977)  
( $\mu\text{g}/\text{m}^3$ )  
STATION 023

PARAMETER	AVERAGE	MAXIMUM 24 HOUR VALUE TIME	MAXIMUM 8 HOUR VALUE TIME	MAXIMUM 3 HOUR VALUE TIME	MAXIMUM 1 HOUR VALUE TIME
SO <sub>2</sub>	0	5.0 9/23/77 2200 10/3/77 1300 11/25/77 1600		5.0 9/23/77 2200-2500 10/3/77 1300-1600 11/1/77 1600-1900	10.5 11/26/77 1400-1500
H <sub>2</sub> S	0				40.0 9/23/77 0600-0700
Particulate	8.4*	23.4 9/28/77			
NMHC	194.0			432.0 9/22/77	2610.0 10/19/77 2100-2200
O <sub>3</sub>	63.0				145.0 10/18/77 1200-1300
NO <sub>x</sub>	2.5				25.0 9/28/77 1600-1700
NO	0				10.0 9/2/77 1200-1300
CO	0.6		360.0 9/24/77 0100-0900		650.0 9/12/77 1300-1400
NO <sub>2</sub>	2.5				20.0 9/28/77 1700-1800

\* Geometric

Table II B-6

QUARTERLY SUMMARY (DECEMBER 1977 - FEBRUARY 1978)  
( $\mu\text{g}/\text{m}^3$ )

STATION 023

PARAMETER	AVERAGE	MAXIMUM 24 HOUR VALUE TIME	MAXIMUM 8 HOUR VALUE TIME	MAXIMUM 3 HOUR VALUE TIME	MAXIMUM 1 HOUR VALUE TIME
SO <sub>2</sub>	1.6	10.0 2/22/78 1600		13.0 2/23/78 0200-0500	13.0 2/20/78 1100-1200
H <sub>2</sub> S	0 **				5.0 1/5/78 2200-2300
Particulate *	4.2	14.0 2/16/78			
O <sub>3</sub>	72.				130.0 2/26/78 1400-1500
NO <sub>x</sub>	2				150.0 1/18/78 1300-1400
NO	0 **				55.0 1/18/78 1300-1400
CO	IM		No data: Instrument Malfunction		No data: Instrument Malfunction
NO <sub>2</sub>	0 **				65.0 1/18/78 1300-1400

IM - Instrument Malfunction

\* - Geometric

\*\* - Rounded Average

Table II B-7

QUARTERLY SUMMARY (MARCH 1978 - MAY 1978)  
( $\mu\text{g}/\text{m}^3$ )  
STATION 023

PARAMETER	AVERAGE	MAXIMUM 24 HOUR VALUE TIME	MAXIMUM 8 HOUR VALUE TIME	MAXIMUM 3 HOUR VALUE TIME	MAXIMUM 1 HOUR VALUE TIME
SO <sub>2</sub>	1	15.0 3/25/78 2300		20.0 3/26/78 1600-1900 20.0 4/26/78 1000-1300	26.0 3/26/78 1800-1900 26.0 4/16/78 1000-1100
H <sub>2</sub> S	0 **				35.0 4/17/78 1000-1100
Particulate *	4.7	33.0 4/9/78			
O <sub>3</sub>	55.				145.0 3/8/78 1200-1300
NO <sub>x</sub>	0 **				25.0 3/14/78 0800-0900
NO	0 **				12.0 4/19/78 1200-1300
CO	400		1600 5/30/78 1800-0200		3000.0 5/27/78 0800-0900
NO <sub>2</sub>	0 **				53.0 3/27/78 1000-1100

\* Geometric  
\*\* - Rounded Average



Table II B-8

QUARTERLY SUMMARY (JUNE 1978 - AUGUST 1978)  
( $\mu\text{g}/\text{m}^3$ )  
STATION 023

PARAMETER	AVERAGE	MAXIMUM 24 HOUR VALUE TIME	MAXIMUM 8 HOUR VALUE TIME	MAXIMUM 3 HOUR VALUE TIME	MAXIMUM 1 HOUR VALUE TIME
SO <sub>2</sub>	3.	11.0 6/1/78 0200 11.0 7/9/78 0100		24.0 6/30/78	26.0 6/30/78 1700-1800 26.0 6/30/78 1800-1900
H <sub>2</sub> S	0 **				14.0 8/8/78 1900-2000 14.0 8/14/78 1700-1800
Particulate *	18.7	64.1 8/10/78			
O <sub>3</sub>	86				161.0 8/27/78 1800-1900
NO <sub>x</sub>	0 **				47.0 7/22/78 1600-1700
NO	0 **				4.0 7/7/78 1000-1100 4.0 7/25/78 1400-1500 4.0 8/9/78 1400-1500
CO	633		4000.0 7/25/78 0100		4200.0 7/25/78 0800-0900
NO <sub>2</sub>	0 **				45.0 7/22/78 1600-1700

\* Geometric

\*\* - Rounded Average

Table II B-9

MAXIMUM CONCENTRATIONS OF SO<sub>2</sub> (µg/m<sup>3</sup>)

STATION 023

(1976 - 1977)

By Month

Item	Nov.	Dec.	Jan.	Feb.	Mar.	Apr. <sup>(2)</sup>	May	June	July	Aug.	Sept.	Oct.
<b>1-Hour Maximum</b>												
Value (µg/m <sup>3</sup> )	16.5	7.8	21.1	11.7	11.5	3.0	5.2	}	2.0	3.0	5.0	10.0
Date	11/23/76	12/9/76	1/20/77	2/4/77	3/8/77	4/24/77	5/16/77		7/29/77	8/24/77	9/23/77	10/26/77
Time (MST)	0945-1045	1040-1140	1505-1605	0055-0155	0830-0930	1445-1545	1840-1940		0950-1050	1150-1250	0600-0700	0800-0900
Wind Direction (Deg.)	4	205	197	249	191	23	202		}	210	270	90
Wind Speed (mps)	1	7	3	0	8	4	1			6	6	2
<b>3-Hour Maximum</b>												
Value (µg/m <sup>3</sup> )	15.9	2.8	17.6	9.4	4.5	2.3	4.7	}	0.9	2.1	5.0	5.0
Date	11/23/76	12/9/76	1/21/77	2/3/77	3/8/77	4/24/77	5/16/77		7/10/77	8/24/77	9/23/77	10/3/77
Time (MST)	0930-1230	0840-1140	0430-0730	1950-2250	0815-1115	1245-1545	1855-2155		0410-0710	1055-1355	2200-2500	1300-1600
Wind Direction (Deg.)	37	194	131	182	194	2	236		207	214	120	225
Wind Speed (mps)	1	7	1	1	9	4	8		5	6	2	9
<b>24-Hour Maximum</b>												
Value (µg/m <sup>3</sup> )	15.5	1.4	11.5	5.9	1.7	1.2	2.3	}	0.3	0.4	5.0	5.0
Date	11/23/76	12/2-3/76	1/25-26/77	2/3-4/77	3/5-6/77	4/24-25/77	5/16-17/77		7/10-11/77	8/19-20/77	9/23/77	10/3/77
Time (MST)	1000	1200	0500	1400	1400	0400	1300		0000	1300	2200	1300
Wind Direction (Deg.)	158	132	148	268	170	319	220		214	305	180	190
Wind Speed (mps)	1	7	2	1	2	2	7		4	2	4	3

(1977 - 1978)

By Month

Item	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
<b>1-Hour Maximum</b>												
Value (µg/m <sup>3</sup> )	10.0	5.0	10.0	13.0	26.0	26.0	}	26.0	16.0	3.0	52.0	
Date	11/26/77	12/6/77	1/5/78	(4)	3/26/78	4/6/78		6/30/78	7/2/78	8/1/78	9/21/78	
Time (MST)	1400-1500	0800-0900	2100-2200		1800	1000		(6)	0800	0900	2400	
Wind Direction (Deg.)	295	210	190		175	185		252.5	170	65	20	
Wind Speed (mps)	3	*	20		3	7		2	5	4	1	
<b>3-Hour Maximum</b>												
Value (µg/m <sup>3</sup> )	5.0	5.0	10.0	13.0	20.0	20.0	}	24	12.0	1.0	17.0	
Date	11/1/77	12/1/77	1/5/78	2/23/78	3/26/78	4/26/78		6/30/78	7/2/78	8/1/78	9/21/78	
Time (MST)	1600-1900	0800-1100	1900-2200	0200	1600	1000		1700	0600	0700	2200	
Wind Direction (Deg.)	155	(3)	190	85	160	185		250	75	82	34	
Wind Speed (mps)	2	1	7	1	3	6		2	1	4	2	
<b>24-Hour Maximum</b>												
Value (µg/m <sup>3</sup> )	5.0	0.0	5.0	10.0	15.0	10.0	}	11.0	11.0	0.1	2.0	
Date	11/25/77	12/8/77	1/15/78	2/22/78	3/25/78	4/13/78		6/11/78	7/9/78	8/1/78	9/21/78	
Time (MST)	1600	0900	1200	1600	2300	0000		0200	0100	0100	0100	
Wind Direction (Deg.)	225	210	225	150	180	180		220	285	128	206	
Wind Speed (mps)	3	2	2	2	1	3		3	3	4	2	

\* Missing Data

(1) No Data. (Lightning strike)

(2) Data Prior to April utilize the Meloy SA185-2 analyzer. On April 1 and thereafter this instrument was replaced by the more accurate SA185-2A analyzer.

(3) No Data. Instrument Malfunction

(4) Maximum concentration occurred 8 times: on 2/20/78 @ 1100 and 1200; on 2/22/78 @ 2100 &amp; 2200 and on 2/23/78 @ 0200, 0300, 0400, 0700

(5) Peak never went above instrument lower detection limit of instrument

(6) Maximum concentration occurred 2 times: on 6/30/78 @ 1700 &amp; 1800

Table II B-10

MAXIMUM CONCENTRATIONS OF  $H_2S$  ( $\mu g/m^3$ )

STATION 023

(1976 - 1977) By Month

Item	Nov.	Dec.	Jan.	Feb.	Mar.	Apr. <sup>(1)</sup>	May <sup>(1)</sup>	June <sup>(1)</sup>	July <sup>(1)</sup>	Aug.	Sept.	Oct.
1-Hour Maximum												
Value ( $\mu g/m^3$ )	19.8	11.2	5.5	3.6	7.1					20.6	40.0	10.0
Date	11/22/76	12/30/76	1/2/77	2/3/77	3/31/77					8/25/77	9/23/77	10/21/77
Time (MST)	1340-1440	0245-0345	0155-0255	1235-1335	0320-0420					1105-1205	0600-0700	0700-0800
Wind Direction (Deg.)	319	119	201	12	36					215	270	190
Wind Speed (mps)	2	2	6	2	0					5	6	1

(1977 - 1978) By Month

Item	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1-Hour Maximum												
Value ( $\mu g/m^3$ )	25.0	0.0	5.0	4.0	(3)	35.0	(3)	3.0	(3)	14.0	(3)	
Date	11/28/77	12/3/77	1/5/78	2/3/78		4/17/78						
Time (MST)	0300-0400	1000-1100	2200-2300	(2)		1000		(4)		5		
Wind Direction (Deg.)	170	245	187	202		295		270		(VA)		
Wind Speed (mps)	1	4	8	6		5		2		1		

- (1) Side-byside monitoring of  $SO_2$  at Station 023 was initiated as a data reliability check for four months beginning 1 April, 1977. Therefore, no  $H_2S$  data were taken at 023 for this time period.
- (2) Maximum concentration occurred 5 times: on 2/3/78 from hours 1400-1800. Associated wind speed & direction is averaged.
- (3) Peak never exceeded instrument lower detection limit
- (4) Maximum concentration occurred 8 times: 6/3/78 @ 0200, 0600, 1400, 1700; 6/5/78 @ 0500, 2400; 6/6/78 @ 0100, 1400
- (5) Maximum concentration occurred 2 times: 8/8/78 @ 1900; 8/14/78 @ 1700
- (VA) - Variable wind direction



Table II B-11

MAXIMUM CONCENTRATIONS OF PARTICULATES ( $\mu\text{g}/\text{m}^3$ ) \*

STATION 020

(1977 - 1978) By Month

Item	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
24-Hour Maximum Value ( $\mu\text{g}/\text{m}^3$ ) Date				6.4 2/13/78	4.2 3/9/78	28.3 4/24/78	33.8 5/24/78	30.9 6/2/78	33.7 7/26/78	32.1 8/10/78	24.2 9/9/78	

\* Monitoring of particulates at Station 020 was initiated on 2/10/78.

Table II B-12

MAXIMUM CONCENTRATIONS OF PARTICULATES ( $\mu\text{g}/\text{m}^3$ )

STATION 023

(1976 - 1977) By Month

Item	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
24-Hour Maximum												
Value ( $\mu\text{g}/\text{m}^3$ )	21	17	22	23	28	36	67	28	33	74	23	21
Date	11/7/76	12/14/76	1/22/77	2/21/77	3/13/77	4/27/77	5/17/77	6/2/77	7/1/77	8/12/77	9/28/77	10/4/77

(1977 - 1978) By Month

Item	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
24-Hour Maximum												
Value ( $\mu\text{g}/\text{m}^3$ )	15	8	7	14.0	5.5	33.0	28.0	33.1	32.0	64.1	23.3	
Date	11/18/77	12/12/77	1/24/78	2/16/78	3/21/78	4/9/78	5/27/78	6/2/78	7/26/78	8/10/78	9/27/78	

Table II B-13  
MAXIMUM CONCENTRATIONS OF CO ( $\mu\text{g}/\text{m}^3$ )

STATION 023

(1976 - 1977) By Month

Item	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1-Hour Maximum												
Value ( $\mu\text{g}/\text{m}^3$ )	896.0	1215.4	716.4	819.7	932.8	1530.8	1075.2	714.3	741.2	848.9	650.0	160.0
Date	11/18/76	12/8/76	1/13/77	2/5/77	3/22/77	4/20/77	5/16/77	6/10/77	7/14/77	8/4/77	9/12/77	10/27/77
Time (MST)	0130-0230	0540-0640	1540-1640	1115-1215	1040-1140	0305-0405	1055-1155	0005-0105	0235-0335	0025-0125	1300-1400	0600-0700
Wind Direction (Deg.)	140	65	124	203	357	235	179	170	158	(1)	150	95
Wind Speed (mps)	0	0	1	3	1	1	13	1	4	(1)	3	2
8-Hour Maximum												
Value ( $\mu\text{g}/\text{m}^3$ )	814.1	1005.4	584.7	569.6	581.9	816.8	793.5	383.5	573.0	747.4	360.0	130.0
Date	11/23/76	12/6/76	1/27/77	2/19/77	3/22/77	4/19/77	5/13/77	6/9/77	7/16/77	8/3/77	9/24/77	10/27/77
Time (MST)	2355-0755	2155-0555	0655-1455	0555-1355	0955-1755	2055-0455	0955-1755	2255-0655	1255-2055	1755-0155	0100-0900	0300-1100
Wind Direction (Deg.)	146	152	192	360	158	162	309	170	101	(1)	145	130
Wind Speed (mps)	1	3	2	2	1	0	4	1	2	(1)	2	3

(1977 - 1978) By Month

Item	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.*	Oct.
1-Hour Maximum												
Value ( $\mu\text{g}/\text{m}^3$ )	130.0	(2)	(2)	(2)	500.0	800.0	3000.0	2100.0	4200.0	1100.0	500.0	
Date	11/1/77				3/28/78	4/16/78	5/27/78	6/14/78	7/25/78	8/4/78	9/29/78	
Time (MST)	0000				1000	1600	0800	2100	0800	0700	1500	
Wind Direction (Deg.)	230				315	230	300	185	195	65	360	
Wind Speed (mps)	1				2	6	1	5	5	1	3	
8-Hour Maximum												
Value ( $\mu\text{g}/\text{m}^3$ )	90.0	(2)	(2)	(2)	400.0	600.0	1600.0	1030.0	4000.0	360.0	290.0	
Date	11/1/77				3/30/78	4/23/78	5/30/78	6/1/78	7/25/78	8/2/78	8/29/78	
Time (MST)	0000-0800				0800	2200	1800	1500	0100	0400	1300	
Wind Direction (Deg.)	175				195	205	140	235	128	140	144	
Wind Speed (mps)	1				5	1	6	4	2	1	3	

\* On September 12, 1978 the gas chromatograph at Station 023 was replaced with a new N.D.I.R. monitor  
(1) No data. (Lightning strike)  
(2) No data. Instrument Malfunction



Table II B-14

MAXIMUM CONCENTRATIONS OF NOX ( $\mu\text{g}/\text{m}^3$ ) \*  
STATION 020

( 1977 - 1978 ) By Month

Item	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1-Hour Maximum Value ( $\mu\text{g}/\text{m}^3$ ) Date Time (MST) Wind Direction (Deg.) Wind Speed (mps)									45 7/20/78 0400 95 2	8 8/9/78 2000 112 2	19 9/19/78 0800 MT 1	

\* Monitoring of NOX at Station 020 was initiated on 7/6/78

MT Instrument down for maintenance

Table II B-15

MAXIMUM CONCENTRATIONS OF NOX ( $\mu\text{g}/\text{m}^3$ )  
STATION 023

(1977 - 1978) By Month

Item	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1-Hour Maximum Value ( $\mu\text{g}/\text{m}^3$ )			150.0		25.0	6.0	4.0	4.0	47.0	11.0	15.0	
Date			1/18/78		3/14/78	4/26/78	5/1/78	6/21/78	7/22/78	8/2/78	9/27/78	
Time (MST)			1300		0800	0400	0200	0200	1600	0600	0800	
Wind Direction (Deg.)			225		340	185	215	165	350	390	VA	
Wind Speed (mps)			3		1	4	1	1	3	1	cm	

cm - calm

VA - Variable Wind Direction

(1) No Data: Instrument Malfunction

(2) No Data: Instrument Malfunction

(3) No Data: Instrument Malfunction

Table II B-16

MAXIMUM CONCENTRATIONS OF NO ( $\mu\text{g}/\text{m}^3$ )\*

STATION 020

(1977 - 1978) By Month

Item	Nov	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1-Hour Maximum Value ( $\mu\text{g}/\text{m}^3$ ) Date Time (MST) Wind Direction (Deg.) Wind Speed (mps)									29.0 7/20/78 0400-0500 95 2	4.0 8/9/78 2000-2100 112 2	12.0 9/18/78 0800-0900 270 1	

\* Monitoring of nitric oxide at Station 020 was initiated on 7/6/78.



Table II B-17

MAXIMUM CONCENTRATIONS OF NO ( $\mu\text{g}/\text{m}^3$ )

STATION 023

(1976 - 1977)

By Month

Item	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1-Hour Maximum												
Value ( $\mu\text{g}/\text{m}^3$ )	54.8	202.2	10.9	0.9	3.6	14.7	5.6	11.5	1.6	7.0	10.0	5.0
Date	11/2/76	12/29/76	1/8/77	2/11/77	3/14/77	4/25/77	5/20/77	6/24/77	7/10/77	8/31/77	9/2/77	10/2/77
Time (MST)	0800-0900	0600-0700	2135-2235	0715-0815	0300-0400	1150-1250	0010-0110	1250-1350	0855-0955	1030-1130	1200-1300	0700-0800
Wind Direction (Deg.)	94	129	291	176	238	349	167	8	213	2	225	215
Wind Speed (mps)	0	1	3	1	1	4	1	5	8	2	4	0

(1977 - 1978)

By Month

Item	Nov.	Dec.	Jan.*	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1-Hour Maximum												
Value ( $\text{g}/\text{m}^3$ )	(1)	(1)	55.0	2.0	4.0	12.0	7.0	1.0	4.0	4.0	2.0	
Date			1/18/78	2/3/78	(3)	(4)	(5)	(6)	(7)	8/19/78	(8)	
Time (MST)			1300-1400	(2)	200	320	230	200	188	1400-1500	VA	
Wind Direction (Deg.)			330	210	2	4	4	2	2	255	0	
Wind Speed (mps)			3	6						4		

\* A New Monitor Labs 8440E instrument was installed in January 1978.

VA - Variable wind

(1) No Data. Instrument Failure.

(2) Maximum concentration occurred 2 times: 2/3/78 @ 1500 @ 1600.

(3) Maximum concentration occurred 3 times: 3/30/78 @ 2200; 3/31/78 @ 0600 &amp; 0700

(4) Maximum concentration occurred 2 times: 4/19/78 @ 1200; 4/22/78 @ 0800

(5) Maximum concentration occurred 3 times: 5/7/78 @ 0600; 5/13/78 @ 1300; 5/18/78 @ 0900

(6) Maximum concentration occurred 17 times during June

(7) Maximum concentration occurred 2 times: 7/7/78 @ 1000; 7/25/78 @ 1400

(8) Maximum concentration occurred 2 times: 9/24/78 @ 0800; 9/26/78 @ 0100

Table II B-18

MAXIMUM CONCENTRATIONS OF NO<sub>2</sub> (µg/m<sup>3</sup>) \*

STATION 020

(1977 - 1978) By Month

Item	Nov	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1-Hour Maximum Value (µg/m <sup>3</sup> ) Date Time (MST) Wind Direction (Deg.) Wind Speed (mps)									19.0 7/31/78 0900-1000 108 8	6.0 (1) 111 2	4.0 9/20/78 0800-0900 RF RF	

\* Monitoring of nitrogen dioxide at Station 020 was initiated on 7/6/78.

RF - Recording Failure

(1) - Maximum concentration occurred 4 times: 8/11/78 @ 0600, 0700 &amp; 0800; 8/12/78 @ 0100

Table II B-19

MAXIMUM CONCENTRATIONS OF NO<sub>2</sub> (µg/m<sup>3</sup>)

STATION 023

By Month

(1976 - 1977)

Item	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1-Hour Maximum												
Value (µg/m <sup>3</sup> )	95.2	84.6	24.7	1.9	3.7	17.5	7.3	30.1	25.7	13.7	20.0	10.0
Date	11/28/76	12/1/76	1/7/77	2/11/77	3/21/77	4/21/77	5/19/77	6/28/77	7/9/77	8/9/77	9/28/77	10/2/77
Time (MST)	0240-0340	1020-1120	0255-0355	1210-1310	1000-1100	0230-0330	1740-1840	1520-1620	0445-0545	0825-0925	1700-1800	0500-0600
Wind Direction (Deg.)	174	116	130	341	8	172	332	301	83	(1)	220	135
Wind Speed (mps)	0	1	2	5	1	0	4	5	2	1	5	1

By Month

(1977 - 1978)

Item	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1-Hour Maximum												
Value (µg/m <sup>3</sup> )	(2)	(2)	65.0	(2)	53.0	(3)	(3)	4.0	45.0	9.0	4.0	
Date			1/18/78		3/27/78			6/21/78	7/22/78	8/2/78	9/20/78	
Time (MST)			1300-1400		1000-1100			(4)	1600-1700	0600-0700	0800-0900	
Wind Direction (Deg.)			330		70			108	350	390	cm	
Wind Speed (mps)			3		1			1	1	1	2	

\* A New Monitor Labs 8440E instrument was installed in January 1978.

cm - calm wind

(1) No data. (Lightning strike)

(2) No data. Instrument malfunction.

(3) Maximum concentration never exceeded zero.

(4) Maximum concentration occurred 2 times: 6/21/78 @ 0200 &amp; 0400.



TABLE II B-20

MAXIMUM CONCENTRATIONS OF OZONE ( $\mu\text{g}/\text{m}^3$ ) \*

STATION 020

(1977 - 1978) By Month

Item	Nov	Dec	Jan.	Feb	Mar.	Apr.	May	June	July	Aug	Sept.	Oct
1 - Hour Maximum Value ( $\mu\text{g}/\text{m}^3$ ) Date Time (MST) Wind Direction (Deg) Wind Speed (mps)									157.0 7/11/78 1100-1200 183 4	84.0 8/19/78 1800-1900 235 3	90.0 9/18/78 0800-0900 270 1	

\* Monitoring of Ozone at Station 020 was initiated on 7/6/78.

TABLE II B-21

MAXIMUM CONCENTRATIONS OF OZONE ( $\mu\text{g}/\text{m}^3$ )

STATION 023

(1976 - 1977) By Month

Item	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1-Hour Maximum												
Value ( $\mu\text{g}/\text{m}^3$ )	115.1	97	88.7	95.7	105.5	118.5	127.6	147.5	147.8	164.1	115.0	145.0
Date	11/20/76	12/1/76	1/12/77	2/26/77	3/24/77	4/18/77	5/17/77	6/18/77	7/23/77	8/24/77	9/4/77	10/18/77
Time (MST)	1100-1200	0015-0115	2155-2255	1855-1955	1520-1620	1540-1640	1445-1545	1450-1550	1345-1445	1025-1125	1200-1300	1200-1300
Wind Direction (Deg.)	343	358	139	268	193	237	204	219	(1)	(1)	195	460
Wind Speed (mps)	2	4	1	3	8	7	9	8	(1)	(1)	3	3

(1977 - 1978) By Month

Item	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1-Hour Maximum												
Value ( $\mu\text{g}/\text{m}^3$ )	85.0	75.0	80.0	130.0	145.0	140.0	130.0	24.0	145.0	161.0	153.0	
Date	11/10/77	12/8/77	1/25/78	2/26/78	3/8/78	4/21/78	5/11/78	6/30/78	7/7/78	8/27/78	9/8/78	
Time (MST)	1300-1400	1200-1300	1600-1700	1400-1500	1200-1300	0700-0800	1400-1500	1700-1800	1200-1300	1800-1900	1500-1600	
Wind Direction (Deg.)	250	315	180	210	200	190	235	250	200	320	69	
Wind Speed (mps)	1	5	7	6	1	1	9	2	6	6	3	

(1) No data. (Lightning strike)

TABLE II B-22

MONTHLY ARITHMETIC AMBIENT AIR CONSTITUENT CONCENTRATIONS  
OF GASES AND PARTICULATES ( $\mu\text{g}/\text{m}^3$ )  
STATION 023

(1977)

CONSTITUENT	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	AVERAGE
NO	0.3	0	0.2	1.3	0.1	0.2	0.1	1.1	0	(1)	(1)	(1)	0.6
NO <sub>2</sub>	0.5	0.1	0.2	1.1	0	0.3	0.6	0.1	0	(1)	(1)	(1)	0.9
O <sub>3</sub>	70.3	74.3	78.9	80.6	95.3	91.5	89.0	95.8	70.0	65.0	55.0	(1)	79.7
CH <sub>4</sub>	872.3	745.8	789.4	911.0	921.3	890.3	853.8	822.0	(1)	(1)	(1)	(1)	873
CO	326.5	312.0	370.9	*	437.8	275.1	266.2	239.3	(1)	(1)	(1)	(1)	335
SO <sub>2</sub> (3)	1.7	0.4	0.1	0.1	0.1	0.1	0.1	0	0	0	0	(1)	0.3
H <sub>2</sub> S	0.4	0.1	0.3	(2)	(2)	(2)	(2)	1.2	0	0	0	(1)	0.17
PARTICULATE	3.3	6.7	6.3	6.4	18.2	14.9	11.5	8.5	12.3	11.5	0	(1)	8.3 †

(1978)

CONSTITUENT	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	AVERAGE
NO	(1)	(1)	0.5	4.0	5.0	0	0	0	0				
NO <sub>2</sub>	(1)	(1)	0.0	0	0	0	0	0	0				
O <sub>3</sub>	60.0	96.0	95.0	83.0	83.0	57.0	100.0	102.0	84.0				
CH <sub>4</sub>	(1)	(1)	(1)	89.5	874	900	1100	900	(1)				
CO	(1)	(1)	(1)	400.0	400	400	1300	200	0				
SO <sub>2</sub> (3)	2.6	2.0	1.0	2.0	0	5.0	3.0	0	0				
H <sub>2</sub> S	0	0	0	1.0	0	0	0	0	0				
PARTICULATE	4.6	5.3	2.1	17.3	14.8	21.0	21.7	23.9	14.5				

† Annual geometric mean in 1977 for Particulates was  $6.7 \mu\text{g}/\text{m}^3$ .

\* Missing data.

(1) 50% or less data.

(2) Side by side testing was initiated for SO<sub>2</sub> at Station 023 as a data reliability check for four months beginning 1 April, 1977. Therefore, no H<sub>2</sub>S data were taken at 023 for this time period.

(3) SO<sub>2</sub> data prior to April utilize the Weloy SA185-2 analyzer. On April 1 and thereafter, instrument was replaced by the more accurate SA185-2A analyzer.



# NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

NITRIC OXIDE (NO)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 2/01/78 TO 2/28/78)

[illegible]

0 = NO OBSERVATIONS

Page 2 of 4

NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

ZONE (03)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 2/01/78 TO 2/28/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																		TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL	
	117	109	107	109	109	115	121	107	125	131	123	105	113	115	123	113	125		
GT 260. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
240. - 260. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
220. - 240. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
200. - 220. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
180. - 200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
160. - 180. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
140. - 160. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
120. - 140. :	0	0	0	0	0	0	1	0	6	17	3	0	0	0	1	0	1	29	
100. - 120. :	5	4	2	3	1	3	9	8	24	44	15	4	8	8	15	12	11	176	
80. - 100. :	4	2	5	3	9	16	51	39	36	30	14	10	10	9	10	5	13	270	
60. - 80. :	0	0	2	0	1	4	8	9	10	15	6	2	1	3	1	0	0	62	
40. - 60. :	0	0	0	1	1	0	1	3	5	1	2	0	1	1	1	0	0	17	
20. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
LT 20. :	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	
TOTAL :	9	6	13	7	12	23	70	59	81	109	40	15	20	21	28	17	25	556	
MEAN	104	102	92	92	88	90	90	88	93	100	97	94	96	93	99	104	100	95	

0 = NO OBSERVATIONS

Table II B-23

Page 3 of 4

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## SULFUR DIOXIDE (SO2)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 2/01/78 TO 2/28/78)

CONCENTRATION MAX UG/M**3	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION				WSW	W	WNW	NW	NNW	CALM	TOTAL
									S	SSW	SW	SSW							
GT 130. :	13	10	13	10	10	10	13	10	0	0	0	10	7	10	13	0	0	0	0
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. - 20. :	1	2	1	1	2	7	10	6	7	10	2	2	0	2	3	4	4	4	64
LT 10. :	9	4	12	6	10	16	60	53	74	99	38	14	20	19	25	13	21	21	493
TOTAL :	10	6	13	7	12	23	70	59	81	109	40	16	20	21	28	17	25	25	557
MEAN CONC.	3	6	3	2	2	3	1	1	1	2	1	2	0	1	1	3	3	3	2

0 = NO OBSERVATIONS



## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

HYDROGEN SULFIDE (H<sub>2</sub>S)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 2/01/78 TO 2/28/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																	TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	
GT 130. :	0	0	0	0	0	0	2	2	4	4	0	0	0	0	0	0	0	0
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. - 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LT 10. :	10	6	13	7	12	23	70	59	82	110	40	16	20	21	28	17	25	559
TOTAL :	10	6	13	7	12	23	70	59	82	110	40	16	20	21	28	17	25	559
MEAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

0 = NO OBSERVATIONS

Table II B-24

Page 1 of 10

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

NITRIC OXIDE (NO)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 3/01/78 TO 3/31/78)

CONCENTRATION YAX UG/M**3	WIND DIRECTION																		TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM		
	0	1	1	0	2	3	3	2	2	2	2	2	2	2	2	1	1		
GT 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10. - 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
LT 10. :	7	9	9	7	18	39	61	48	100	98	26	13	16	27	36	30	30	574	
TOTAL :	7	9	9	7	18	39	61	48	100	98	26	13	16	27	36	30	30	574	
MEAN CONC.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	

0 = NO OBSERVATIONS

Table II B-24

Page 2 of 10

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## NITROGEN OXIDES (NOX)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD: 3/01/78 TO 3/31/78

CONCENTRATION MAX UG/M**3	WIND DIRECTION																C-B SHALE OIL PROJECT			
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL		
GT 130. :	5	5	5	9	5	6	5	4	5	5	3	2	10	22	15	24	7			
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0		
10. - 20. :	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0		
LT 10. :	7	9	8	5	16	38	58	42	78	85	21	12	13	16	29	22	26	26		
TOTAL :	7	9	8	5	16	38	58	42	78	85	21	12	14	18	30	24	26	26		
MEAN CONC.	1	0	0	1	0	0	0	0	0	0	0	1	1	4	2	3	0	0		

0 = NO OBSERVATIONS



## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

C-B SHALE OIL PROJECT													
TRAILER NO. - 23 PERIOD( 3/01/78 TO 3/31/78)													
WIND DIRECTION													
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Table II B-24

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## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

OZONE (03)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 3/01/78 TO 3/31/78)

CONCENTRATION MAX UG/M**3	N 96	NNE 135	NE 113	ENE 98	F 111	ESE 135	SE 135	SSE 143	S 143	WIND DIRECTION				WSW 113	W 115	WNW 125	NW 119	NNW 131	TOTAL	
										SSW	S	SSW	SW						CALM	TOTAL
GT 260. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
240. - 260. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
220. - 240. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
200. - 220. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
180. - 200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
160. - 180. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
140. - 160. :	0	0	0	0	0	0	0	1	2	3	0	0	0	0	0	0	0	0	0 :	6
120. - 140. :	0	1	0	0	0	2	3	3	7	17	5	0	0	0	0	2	0	3	1 :	49
100. - 120. :	0	1	2	0	5	5	10	13	40	27	10	7	12	13	12	7	21	3	3 :	172
80. - 100. :	8	4	9	5	9	30	25	20	42	43	9	3	2	7	2	17	10	17	9 :	252
60. - 80. :	3	4	0	3	9	4	18	11	14	14	5	4	3	6	3	6	8	6	21 :	133
40. - 60. :	1	0	0	0	0	0	1	0	2	0	0	2	2	0	0	0	0	0	0 :	8
20. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
LT 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
TOTAL :	12	10	11	8	23	41	62	48	107	104	29	16	19	28	19	28	39	29	34	620
MEAN CONC.	83	89	93	82	86	91	91	93	97	99	96	88	96	97	98	97	98	92	80	93

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

SULFUR DIOXIDE (SO2)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 3/01/78 TO 3/31/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																NW	NNW	CALM	TOTAL				
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	2	10					13	18		
GT 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20. - 30. :	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3	3
10. - 20. :	1	2	1	1	0	3	2	1	3	1	2	0	0	0	1	5	3	26						
LT 10. :	11	8	10	7	21	38	60	45	104	98	27	15	19	28	38	46	29	584						
TOTAL :	12	10	11	8	21	41	62	47	108	99	29	16	19	28	39	31	32	613						
MEAN	1	2	2	3	0	1	0	0	0	0	1	1	0	0	0	2	2	1						

0 = NO OBSERVATIONS



Table II B-24

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## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

HYDROGEN SULFIDE (H<sub>2</sub>S)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 3/01/78 TO 3/31/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																		TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM		
GT 130. :	0	0	0	0	1	8	8	8	8	8	1	0	0	0	0	0	0	0	
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10. - 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
LT 10. :	12	10	11	6	21	40	55	46	107	97	26	16	19	28	37	27	31	595	
TOTAL :	12	10	11	6	21	40	59	46	107	97	23	16	19	28	37	27	31	595	
MEAN CONC.	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

TOTAL HYDROCARBONS (THC)																		
TRAILER NO. - 23 PERIOD( 3/01/78 TO 3/31/78)																		
CONCENTRATION MAX UG/M**3	WIND DIRECTION																	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL
2750	2619	2685	2161	2357	2488	2423	2161	3209	2292	2161	1571	1440	0	3012	3078	2423		
GT 4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3800. -4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3600. -3800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3400. -3600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3200. -3400. :	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
3000. -3200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3
2800. -3000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
2600. -2800. :	1	1	2	0	0	0	0	0	1	0	0	0	0	0	1	0	0	7
2400. -2600. :	0	0	1	0	0	1	1	0	1	0	0	0	0	2	1	1	1	8
2200. -2400. :	0	0	0	0	1	0	0	0	0	3	0	0	0	0	0	0	0	4
2000. -2200. :	0	0	0	1	0	0	1	1	3	2	1	0	0	0	0	0	0	9
1800. -2000. :	0	0	1	0	0	1	0	0	4	2	2	0	0	0	0	0	0	10
1600. -1800. :	0	0	0	0	0	1	1	1	5	4	2	0	0	0	0	0	1	15
LT 1600. :	2	0	1	0	4	11	16	13	27	22	9	3	3	0	1	2	15	129
TOTAL :	3	1	5	1	5	14	19	15	43	33	14	3	3	0	5	7	17	188
MEAN CONC.	1790	2619	2226	2161	1611	1562	1506	1392	1634	1484	1511	1375	1288	0	2410	2395	1433	1612

0 = NO OBSERVATIONS

Table II B-24

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## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

METHANE (CH<sub>4</sub>)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD: 3/01/78 TO 3/31/78

CONCENTRATION MAX UG/M**3	WIND DIRECTION																C-B SHALE OIL PROJECT			
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL		
	916	916	916	916	916	982	982	982	982	982	916	916	851	851	916	916	1047			
GT 2600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2400. -2600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2200. -2400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2000. -2200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1800. -2000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1600. -1800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1400. -1600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1200. -1400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1000. -1200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
800. -1000. :	7	4	6	2	7	14	14	11	34	27	10	5	2	1	6	7	20	177		
600. - 800. :	3	2	1	2	3	11	12	8	16	11	5	2	2	0	2	1	2	83		
400. - 600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
200. - 400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
LT 200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
TOTAL :	10	6	7	4	10	25	26	19	50	38	15	7	4	1	8	8	25	203		
MEAN CONC.	851	851	879	818	851	825	838	844	839	839	838	842	818	851	867	859	919	849		

0 = NO OBSERVATIONS



## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## NON-METHANE HYDROCARBONS

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 3/01/78 TO 3/31/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																CALM				TOTAL
	N 609	NNE 609	NE 609	ENE 609	E 609	ESE 609	SE 609	SSE 609	S 916	SSW 851	SW 609	WSW 609	W 609	WNW 609	NW 609	NNW 609	CALM 609				
GT 3000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
800. :	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2			
600. :	10	6	7	4	10	25	26	19	51	38	15	7	4	1	8	8	25	264			
LT 600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
TOTAL :	10	6	7	4	10	25	26	19	52	39	15	7	4	1	8	8	25	266			
MEAN CONC.	609	609	609	609	609	609	609	609	615	619	609	609	609	609	609	609	609	611			

0 = NO OBSERVATIONS

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# NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 3/01/78 TO 3/31/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION												NW	NNW	CALM	TOTAL	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW					
CT 4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3750. -4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3500. -3750. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3250. -3500. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3000. -3250. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2750. -3000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2500. -2750. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2250. -2500. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000. -2250. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1750. -2000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500. -1750. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1250. -1500. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000. -1250. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LT 1000. :	10	6	7	4	10	20	23	17	48	36	15	7	4	1	3	8	25 : 249
TOTAL :	10	6	7	4	10	20	23	17	48	36	15	7	4	1	3	8	25 : 249
MEAN CONC.	275	229	279	229	264	235	209	223	270	261	283	229	258	344	273	215	243 : 251

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

NITRIC OXIDE (NO)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 4/01/78 TO 4/30/78)

CONCENTRATION MAX UG/M**3	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION			W	WNW	NW	NNW	CALM	TOTAL
									S	SSW	SW						
11	9	9	7	11	11	11	8	9	9	9	11	12	9	9	12	11	
GT 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. - 20. :	1	0	0	0	1	1	0	0	0	0	1	1	0	0	1	2	8
LT 10. :	4	12	5	5	11	21	37	30	137	100	55	49	42	40	24	20	652
TOTAL :	5	12	5	5	12	22	37	30	137	100	56	50	42	40	25	22	660
MEAN CONC.	7	4	4	3	5	3	3	3	3	2	3	4	5	3	4	4	3

0 = NO OBSERVATIONS



## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## NITROGEN OXIDES (NOX)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 4/01/78 TO 4/30/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																TOTAL			
	N	NNE	NE	ENE	E	ESE	SE	SSE	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL				
GT 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
10. - 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
LT 10. :	5	12	5	5	12	22	37	30	137	100	60	56	42	40	25	22				
TOTAL :	5	12	5	5	12	22	37	30	137	100	60	56	42	40	25	22				
MEAN CONC.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## NITROGEN DIOXIDE (NO2)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 4/01/78 TO 4/30/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																TOTAL			
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL		
ST 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. - 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LT 10. :	5	12	5	5	12	22	37	30	137	100	60	56	50	42	40	25	22	22	660	660
TOTAL :	5	12	5	5	12	22	37	30	137	100	60	56	50	42	40	25	22	22	660	660
MEAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CONC.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

OZONE (03)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 4/01/78 TO 4/30/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																			TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM			
86	86	94	86	88	86	98	93	98	137	137	129	120	112	103	103	112	112			
CT 260. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
240. - 260. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
220. - 240. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
200. - 220. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
180. - 200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
160. - 180. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
140. - 160. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
120. - 140. :	0	0	0	0	0	0	0	0	2	2	1	1	0	0	0	0	0	0		
100. - 120. :	0	0	0	0	0	0	0	0	16	21	13	8	8	9	5	3	3	86		
80. - 100. :	3	8	4	3	4	8	6	15	63	36	19	15	13	18	17	11	8	251		
60. - 80. :	2	4	1	2	7	9	24	10	41	34	18	25	21	12	15	9	9	243		
40. - 60. :	0	0	0	0	1	2	2	2	6	3	7	4	7	3	2	2	2	43		
20. - 40. :	0	0	0	0	0	0	0	1	0	1	1	3	0	1	0	0	0	7		
LT 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
TOTAL :	5	12	5	5	12	19	32	28	128	97	59	56	49	43	39	25	22	636		
MEAN CONC.	81	86	84	79	76	75	73	78	85	86	83	79	79	84	81	82	82	82		

0 = NO OBSERVATIONS



## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

SULFUR DIOXIDE (SO2)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 4/01/78 TO 4/30/78)

CONCENTRATION MAX UG/M**3	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION			WSW	W	WNW	NW	NNW	CALM	TOTAL
									S	SSW	SSW							
GT 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
10. - 20. :	0	1	0	0	0	1	4	1	8	0	0	1	2	0	4	0	0	22
LT 10. :	5	11	5	5	12	21	33	29	127	100	61	55	46	42	36	25	22	635
TOTAL :	5	12	5	5	12	22	37	30	136	100	61	56	48	43	40	25	22	659
MEAN	2	3	1	3	2	2	3	2	2	1	2	2	2	1	2	1	1	2

CONC.

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

HYDROGEN SULFIDE (H<sub>2</sub>S)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 4/01/78 TO 4/30/78)

CONCENTRATION MAX UG/M**3	N	NNL	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION				W	WNW	NW	NNW	CALM	TOTAL
									S	SSW	SW	WSW						
GT 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30. - 40. :	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	2
20. - 30. :	0	0	0	0	0	0	1	0	3	0	0	0	0	0	1	0	0	5
10. - 20. :	0	1	0	0	0	0	1	1	5	2	0	0	2	0	1	0	0	13
LT 10. :	5	10	4	5	12	21	35	29	129	98	61	56	48	42	38	24	22	639
TOTAL :	5	11	4	5	12	22	37	30	137	100	61	56	50	43	40	24	22	659
MEAN CONC.	0	1	1	0	0	1	0	0	1	0	0	0	1	1	1	0	0	0

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## TOTAL HYDROCARBONS (THC)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 4/01/78 TO 4/30/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																TOTAL			
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL		
GT 4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3800. -4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3600. -3800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3400. -3600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3200. -3400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3000. -3200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2800. -3000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2600. -2800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2400. -2600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
2200. -2400. :	1	0	0	0	0	0	2	0	1	1	1	2	0	0	2	1	0	0	0	11
2000. -2200. :	0	0	1	0	0	1	0	1	6	7	4	0	1	2	5	1	0	0	0	29
1800. -2000. :	0	0	0	0	0	0	0	0	9	7	6	5	7	1	1	1	0	0	0	37
1600. -1800. :	0	1	0	2	3	1	7	6	10	11	5	7	3	3	2	3	2	0	0	66
LT 1600. :	1	4	1	1	7	13	20	18	60	44	28	28	28	12	6	5	6	0	0	282
TOTAL :	2	5	2	3	10	15	29	25	86	70	44	42	39	18	17	11	8	0	0	426
MEAN CONC.	1801	1257	1670	1571	1486	1436	1558	1454	1501	1545	1592	1534	1466	1502	1807	1691	1416	1532		

0 = NO OBSERVATIONS



NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## NON-METHANE HYDROCARBONS

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD: 4/01/78 TO 4/30/78)

CONCENTRATION MAX UG/M**3	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION				W	WNW	NW	NNW	CALM	TOTAL
									S	SSW	SW	WSW						
1309	720	982	785	785	1113	1309	1178	1375	1178	1178	1506	1244	1113	1375	1375	785	785	
GT 3000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2800. -3000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2600. -2800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2400. -2600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200. -2400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000. -2200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800. -2000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600. -1800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400. -1600. :	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
1200. -1400. :	1	0	0	0	0	0	2	0	3	0	0	0	1	0	3	1	0	11
1000. -1200. :	0	0	0	0	0	1	1	2	8	10	5	1	2	2	5	1	0	38
800. -1000. :	0	0	1	0	0	1	3	1	10	6	6	5	5	1	1	1	0	41
600. - 800. :	0	1	0	2	5	3	15	7	13	13	8	13	6	5	2	4	3	100
LT 600. :	1	4	1	1	5	10	6	15	52	41	25	22	24	10	6	4	5	234
TOTAL :	2	5	2	3	10	15	29	25	86	70	44	42	38	18	17	11	8	425
MEAN	785	327	687	633	556	567	695	586	632	613	646	598	561	574	832	732	491	621

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

CARBON MONOXIDE (CO)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 4/01/78 TO 4/30/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																TOTAL			
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL		
GT 4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3750. -4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3500. -3750. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3250. -3500. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3000. -3250. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2750. -3000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2500. -2750. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2250. -2500. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000. -2250. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1750. -2000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500. -1750. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1250. -1500. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000. -1250. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LT 1000. :	5	12	5	5	12	22	33	25	116	80	48	46	44	40	38	24	22	577		
TOTAL :	5	12	5	5	12	22	33	25	116	80	48	46	44	40	38	24	22	577		
MEAN	459	412	436	390	440	386	383	372	379	367	455	444	410	419	390	426	423	402		

0 = NO OBSERVATIONS

CONC.



## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL.

NITRIC OXIDE (NO)		C-B SHALE OIL PROJECT													
		TRAILER NO. - 23 PERIOD( 5/01/78 TO 5/31/78)													
CONCENTRATION MAX UG/M**3		WIND DIRECTION													
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	TOTAL
GT 130. :		6	6	6	6	6	6	6	6	7	7	6	6	6	6
120. - 130. :		0	0	0	0	0	0	0	0	0	0	0	0	0	0
110. - 120. :		0	0	0	0	0	0	0	0	0	0	0	0	0	0
100. - 110. :		0	0	0	0	0	0	0	0	0	0	0	0	0	0
90. - 100. :		0	0	0	0	0	0	0	0	0	0	0	0	0	0
80. - 90. :		0	0	0	0	0	0	0	0	0	0	0	0	0	0
70. - 80. :		0	0	0	0	0	0	0	0	0	0	0	0	0	0
60. - 70. :		0	0	0	0	0	0	0	0	0	0	0	0	0	0
50. - 60. :		0	0	0	0	0	0	0	0	0	0	0	0	0	0
40. - 50. :		0	0	0	0	0	0	0	0	0	0	0	0	0	0
30. - 40. :		0	0	0	0	0	0	0	0	0	0	0	0	0	0
20. - 30. :		0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. - 20. :		0	0	0	0	0	0	0	0	0	0	0	0	0	0
LT 10. :		14	18	13	9	19	23	33	23	121	124	73	29	31	719
TOTAL :		14	18	13	9	19	23	33	23	121	124	73	29	31	719
MEAN CONC.		5	5	5	5	5	5	5	5	5	5	5	5	5	5

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## NITROGEN OXIDES (NOX)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 5/01/78 TO 5/31/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																TOTAL			
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL		
GT 130. :	3	3	3	0	1	1	3	1	1	3	1	1	3	3	3	3	3	3		
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
10. - 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
LT 10. :	14	18	13	9	19	23	33	23	121	124	72	29	31	31	87	39	32	713		
TOTAL :	14	18	13	9	19	23	33	23	121	124	72	29	31	31	87	39	32	713		
MEAN CONC.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## NITROGEN DIOXIDE (NO2)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD: 5/01/78 TO 5/31/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																TOTAL			
	N	NNE	NE	ENE	E	ESE	SE	SSE	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL			
GT 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. - 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LT 10. :	14	18	13	9	19	23	33	23	121	124	72	29	31	31	87	39	32	718		
TOTAL :	14	18	13	9	19	23	33	23	121	124	72	29	31	31	87	39	32	718		
MEAN CONC.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

0 = NO OBSERVATIONS



Table II B-26

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## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

OZONE (03)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 5/01/78 TO 5/31/78)

CONCENTRATION MAX UG/M**3	N 99	NNE 103	NE 98	ENE 98	E 96	ESE 101	SE 98	SSE 98	WIND DIRECTION				WSW 115	W 127	WNW 111	NW 109	NNW 103	CALM 98	TOTAL
									S 117	SSW 113	SW 129	SSE							
GT 260. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240. - 260. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220. - 240. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200. - 220. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180. - 200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160. - 180. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140. - 160. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120. - 140. :	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	5
100. - 120. :	0	1	0	0	0	1	0	0	9	25	17	3	1	9	9	1	0	0	76
80. - 100. :	12	7	6	5	7	6	13	10	70	68	35	8	11	9	58	21	21	21	367
60. - 80. :	2	8	5	3	8	8	11	10	34	24	10	11	11	10	16	12	10	10	193
40. - 60. :	0	1	2	1	3	7	8	1	7	4	5	4	3	3	3	4	1	1	57
20. - 40. :	0	0	0	0	1	1	1	2	0	2	0	3	4	0	0	1	0	0	15
LT 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL :	14	17	13	9	19	23	33	23	120	123	71	29	31	31	86	39	32	32	713
MEAN CONC.	89	79	75	76	71	70	72	76	84	88	92	74	74	84	87	80	34	34	83

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

SULFUR DIOXIDE (SO<sub>2</sub>)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD 5/01/78 TO 5/31/78

CONCENTRATION MAX UG/M**3	WIND DIRECTION												WIND DIRECTION				WIND DIRECTION				TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM				
GT 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10. - 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
LT 10. :	14	18	13	9	19	23	33	23	121	124	73	29	31	31	87	39	32	719			
TOTAL :	14	18	13	9	19	23	33	23	121	124	73	29	31	31	87	39	32	719			
MEAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## HYDROGEN SULFIDE (H2S)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 5/01/78 TO 5/31/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																C-B SHALE OIL PROJECT			
	N	NNE	NE	ENE	E	ESE	SE	SSE	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL			
GT 130. :	0	1	0	0	0	0	0	0	0	0	0	2	1	2	1	1				
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10. - 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
LT 10. :	14	18	13	9	18	23	33	23	121	126	71	31	31	87	39	32	718			
TOTAL :	14	18	13	9	18	23	33	23	121	126	71	31	31	87	39	32	718			
MEAN CONC.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			

0 = NO OBSERVATIONS



## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## TOTAL HYDROCARBONS (THC)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD: 5/01/78 TO 5/31/78

CONCENTRATION MAX UG/M**3	WIND DIRECTION																		TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM		
GT 4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3800. -4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3600. -3800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3400. -3600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3200. -3400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3000. -3200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2800. -3000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3910. -2800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2400. -3910. :	2	0	0	0	0	0	0	0	0	2	0	0	0	1	1	0	1	7	
2200. -2400. :	0	1	1	1	1	1	1	0	4	1	1	0	0	0	3	1	3	19	
2000. -2200. :	0	0	2	0	0	0	1	0	5	3	0	2	0	0	5	1	1	20	
1800. -2000. :	0	4	0	2	0	0	1	2	13	4	3	2	0	1	4	4	4	44	
1600. -1800. :	3	3	3	2	2	5	3	3	19	13	4	4	2	6	10	6	3	91	
LT 1600. :	7	3	3	1	7	15	11	11	51	67	35	9	18	11	23	7	11	250	
TOTAL :	12	11	9	6	10	21	17	16	92	90	43	17	20	19	46	19	23	471	
MEAN CONC.	1599	1738	1739	1812	1571	1397	1518	1490	1589	1480	1405	1656	1440	1565	1677	1685	1685	1558	

0 = NO OBSERVATIONS

0 = NO OBSERVATIONS

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NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

METHANE (CH4)										C-B SHALE OIL PROJECT									
TRAILER NO. - 23										PERIOD( 5/01/78 TO 5/31/78)									
CONCENTRATION		N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL
MAX	UG/M**3	1047	982	982	1047	1047	982	1047	1047	1113	1047	982	982	982	1113	1047	1047	1047	1047
GT 2600.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2400.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000.	:	1	0	0	1	2	0	1	2	9	1	0	0	0	1	2	2	1	23
800.	:	9	8	7	4	19	12	18	9	76	76	46	16	18	16	42	14	19	400
600.	:	2	3	1	2	2	10	5	6	29	31	12	5	3	5	6	3	3	128
400.	:	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
200.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LT 200.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	:	12	11	9	7	14	22	24	17	114	108	58	21	21	22	51	19	23	553
MEAN	:	867	869	851	879	912	830	867	847	874	859	856	835	885	893	901	889	897	870

0 = NO OBSERVATIONS

II B-66

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## NON-METHANE HYDROCARBONS

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD 5/01/78 TO 5/31/78

CONCENTRATION VAX UG/M**3	WIND DIRECTION																TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
1768	1440	1637	1637	1178	1506	1375	851	1571	1833	1571	1440	720	1702	1702	1440	1833	
GT 3000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600. :	2	0	1	1	0	0	0	0	0	1	0	0	0	1	2	0	0
1400. :	0	1	0	0	0	1	0	0	4	1	1	0	0	0	0	1	0
1200. :	0	0	0	0	0	0	1	0	1	2	0	2	0	0	3	1	4
1000. :	0	3	2	0	1	0	1	0	3	2	0	1	0	1	6	3	2
800. :	0	3	2	2	0	0	2	3	15	6	4	5	0	2	4	3	2
600. :	4	2	2	3	4	10	5	9	34	22	11	4	6	5	13	5	5
LT 600. :	6	2	2	0	5	10	3	4	36	54	27	4	14	10	18	6	9
TOTAL :	12	11	9	6	10	21	17	16	93	89	45	17	20	19	46	19	23
MEAN CONC.	731	869	887	949	635	570	654	642	714	628	552	832	553	675	777	796	798

0 = NO OBSERVATIONS



## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

C-B SHALE OIL PROJECT																			
TRAILER NO. - 23 PERIOD( 5/01/78 TO 5/31/78)																			
CARBON MONOXIDE (CO)		WIND DIRECTION																	
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	VNW	NW	NNW	CALM	TOTAL
CONCENTRATION		1494	1839	1839	1149	1034	1149	1034	1264	1264	919	1494	1264	1149	1149	2989	1839	1954	
MAX																			
UG/M**3																			
GT 4000.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3750.	-4000.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3500.	-3750.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3250.	-3500.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3000.	-3250.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2750.	-3000.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
2500.	-2750.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2250.	-2500.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000.	-2250.	:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1750.	-2000.	:	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	2	6
1500.	-1750.	:	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2	1	5
1250.	-1500.	:	5	0	1	0	0	0	1	1	0	1	1	0	0	2	2	1	15
1000.	-1250.	:	0	2	0	1	1	1	3	2	0	3	1	3	2	6	2	0	28
LT 1000.	:	7	7	7	6	13	21	23	13	111	108	54	19	18	20	40	12	19	498
TOTAL	:	12	11	9	7	14	22	24	17	114	108	58	21	21	22	51	19	23	553
MEAN CONC.		785	752	689	591	398	710	436	520	307	300	358	438	427	381	570	772	569	434

0 = NO OBSERVATIONS

# NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

[illegible]

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## OXIDES OF NITROGEN (NOX)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 6/01/78 TO 6/30/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																TOTAL			
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM			
GT 130. :	1	0	1	0	1	1	1	3	3	1	1	1	1	1	1	1	0			
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10. - 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
LT 10. :	26	10	12	5	24	35	13	27	73	146	70	24	39	50	62	38	9			
TOTAL :	26	10	12	5	24	35	13	27	73	146	70	24	39	50	62	38	9			
MEAN CONC.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			

0 = NO OBSERVATIONS



## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## NITROGEN DIOXIDE (NO2)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 6/01/78 TO 6/30/78)

CONCENTRATION MAX UG/M**3	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION				W	WNW	NW	NNW	CALM	TOTAL
									S	SSW	SW	WSW						
1	0	0	0	0	1	1	1	3	3	1	1	1	1	1	1	1	1	0
GT 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. - 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LT 10. :	26	10	12	5	24	35	13	27	73	146	70	24	39	50	62	38	9	663
TOTAL :	26	10	12	5	24	35	13	27	73	146	70	24	39	50	62	38	9	663
MEAN CONC.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

OZONE (O3)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 6/01/78 TO 6/30/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																		TOTAL
	N 78	NNE 78	NE 78	ENE 68	E 74	ESE 88	SE 78	SSE 82	S 94	SSW 98	SW 98	WSW 88	W 94	WNW 98	NW 94	NNW 88	CALM 68		
GT 260. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	
240. - 260. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	
220. - 240. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	
200. - 220. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	
180. - 200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	
160. - 180. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	
140. - 160. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	
120. - 140. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	
100. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	
80. - 100. :	0	0	0	0	0	1	0	1	1	4	5	1	2	5	7	3	0	0 :	
60. - 80. :	8	1	3	1	2	2	1	4	14	56	23	3	16	13	18	11	1	1 :	
40. - 60. :	14	7	7	3	15	28	8	21	48	89	36	13	15	24	31	23	4	4 :	
20. - 40. :	4	2	3	1	7	5	4	4	22	9	10	8	6	9	7	1	4	4 :	
LT 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	
TOTAL :	26	10	13	5	24	36	13	30	85	158	74	25	39	51	63	38	9	690	
MEAN CONC.	54	52	52	50	48	50	45	52	51	59	58	50	59	58	59	61	47	56	

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## C-B SHALE OIL PROJECT

## SULFUR DIOXIDE (SO2)

TRAILER NO. - 23 PERIOD( 6/01/78 TO 6/30/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																C-B SHALE OIL PROJECT			
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL		
GT 130. :	13	13	10	5	13	13	10	20	13	13	13	26	26	13	13	13	13			
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
20. - 30. :	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0		
10. - 20. :	3	1	1	0	7	8	4	10	27	53	27	8	8	15	9	6	2	189		
LT 10. :	23	9	12	5	17	28	9	19	59	111	51	16	30	36	54	32	7	518		
TOTAL :	26	10	13	5	24	36	13	30	86	164	78	25	39	51	63	38	9	710		
MEAN CONC.	3	3	3	2	5	4	4	5	5	5	5	6	5	5	4	4	4	4		

0 = NO OBSERVATIONS



## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

HYDROGEN SULFIDE (H<sub>2</sub>S)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 6/01/78 TO 6/30/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																TOTAL			
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL		
GT 130. :	0	1	0	2	1	0	0	1	2	0	2	1	2	1	2	2	0			
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10. - 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
LT 10. :	27	10	13	5	24	36	13	30	88	167	75	25	39	52	63	38	9	714		
TOTAL :	27	10	13	5	24	36	13	30	88	167	75	25	39	52	63	38	9	714		
MEAN CONC.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## TOTAL HYDROCARBONS (THC)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 6/01/78 TO 6/30/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																TOTAL			
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL		
2750	2553	2292	2292	2226	2553	2095	2947	3077	3274	2422	2422	2422	2816	3143	2947	2947	2161			
GT 4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0	0
3800. -4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0	0
3600. -3800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0	0
3400. -3600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0	0
3200. -3400. :	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0 :	1	1
3000. -3200. :	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0 :	3	3
2800. -3000. :	0	0	0	0	0	0	1	0	2	0	0	0	1	3	3	3	0	0 :	13	13
2600. -2800. :	1	0	0	0	0	0	0	0	7	0	0	0	0	4	4	4	0	0 :	20	20
2400. -2600. :	2	2	0	0	0	1	0	1	2	3	3	1	4	8	7	4	0	0 :	38	38
2200. -2400. :	4	2	3	1	5	5	0	4	5	6	5	4	13	8	14	6	0	0 :	85	85
2000. -2200. :	7	2	2	1	6	7	1	6	21	14	7	8	7	8	13	6	2	2 :	118	118
1800. -2000. :	6	3	4	2	5	5	4	2	10	31	15	5	7	10	8	1	4	4 :	122	122
1600. -1800. :	0	0	1	0	1	1	0	2	11	24	13	0	1	3	3	1	1	1 :	62	62
LT 1600. :	5	1	0	0	1	1	0	3	9	63	25	4	4	3	10	11	1	1 :	141	141
TOTAL :	25	10	10	4	18	20	5	19	69	142	68	22	37	48	62	36	8	603		
MEAN CONC.	2014	2089	2036	2062	1990	2056	1964	1968	2035	1622	1680	1964	2108	2214	2101	2062	1932	1918		

0 = NO OBSERVATIONS

C-B SHALE OIL PROJECT

METHANE (CH<sub>4</sub>)

TRAILER NO. - 23 PERIOD( 6/01/78 TO 6/30/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																TOTAL	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		CALM
	1178	1047	1047	1112	1112	1112	1112	1112	1178	1112	1112	1178	1375	1375	1243	1309	1112	
GT 2600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2400. -2600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200. -2400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000. -2200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800. -2000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600. -1800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400. -1600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200. -1400. :	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	4
1000. -1200. :	6	1	2	4	6	1	2	4	17	6	6	6	5	8	19	8	2	103
800. -1000. :	16	9	5	0	11	19	3	11	50	118	55	7	22	27	30	22	5	410
600. - 800. :	2	0	2	0	1	0	0	2	2	14	4	7	4	4	8	4	1	55
400. - 600. :	1	0	1	0	0	0	0	1	1	3	3	2	5	8	4	1	0	30
200. - 400. :	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
LT 200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL :	25	10	10	4	18	20	5	18	70	142	63	22	37	48	62	36	8	603
MEAN	937	936	896	1064	956	900	982	931	947	884	891	889	895	894	936	947	932	913

0 = NO OBSERVATIONS



## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## NON-METHANE HYDROCARBONS

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 6/01/78 TO 6/30/78)

CONCENTRATION MAX UG/M**3	N 1898	NNE 1571	NE 1507	ENE 1244	E 1374	ESE 1702	SE 1243	SSE 2488	WIND DIRECTION				WSW 1506	W 1900	WNW 2423	NW 2161	NNW 2226	CALM 1376	TOTAL
									S 2030	SSW 2162	SW 1571	SSW 2162							
GT 3000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2800. -3000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2600. -2800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2400. -2600. :	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2
2200. -2400. :	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	0	4
2000. -2200. :	0	0	0	0	0	0	0	0	1	1	0	0	1	3	2	0	0	0	8
1800. -2000. :	1	0	0	0	0	0	0	1	3	0	0	1	1	2	1	0	0	0	10
1600. -1800. :	1	0	0	0	0	1	0	0	4	0	0	3	3	3	0	0	0	0	15
1400. -1600. :	1	2	2	0	0	1	0	0	4	3	5	4	8	7	4	0	0	0	50
1200. -1400. :	4	3	1	1	5	5	1	2	15	13	4	6	10	12	10	1	1	1	99
1000. -1200. :	7	2	4	0	6	8	1	9	15	16	14	1	8	14	4	4	4	4	122
800. -1000. :	7	2	3	3	5	4	1	2	10	31	10	7	9	11	4	2	2	2	113
600. - 800. :	2	0	0	0	1	1	2	1	8	26	12	2	0	1	1	1	1	1	60
LT 600. :	2	1	0	0	1	0	0	3	9	52	23	2	3	1	9	0	0	0	115
TOTAL :	25	10	10	4	18	20	5	19	69	142	68	22	37	48	62	36	8	603	
MEAN CONC.	1076	1152	1139	998	1033	1156	982	1086	1088	738	802	1074	1212	1319	1164	1115	999	1008	

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

CARBON MONOXIDE (CO)		C-B SHALE OIL PROJECT															
		TRAILER NO. - 23 PERIOD( 6/01/78 TO 6/30/78)															
CONCENTRATION MAX UG/M**3		WIND DIRECTION															
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	TOTAL
		1034	920	345	229	1150	920	575	459	804	2070	1954	920	920	1034	1034	920
GT 4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3750. -4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3500. -3750. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3250. -3500. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3000. -3250. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2750. -3000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2500. -2750. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2250. -2500. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000. -2250. :	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
1750. -2000. :	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
1500. -1750. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
1250. -1500. :	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
1000. -1250. :	3	0	0	0	0	1	0	0	0	0	0	0	0	0	1	5	11
LT 1000. :	22	10	10	10	4	17	20	5	18	69	140	67	22	37	46	57	582
TOTAL :	25	10	10	10	4	18	20	5	18	69	142	68	22	37	47	58	597
MEAN CONC.	473	425	287	229	383	448	413	363	378	385	390	444	382	433	430	546	406

0 = NO OBSERVATIONS

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 7/01/78 TO 7/31/78)

[illegible]

0 = NO OBSERVATIONS



## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## OXIDES OF NITROGEN (NOX)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 7/01/78 TO 7/31/78)

CONCENTRATION MAX UG/M**3	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION			W	WNW	NW	NNW	CALM	TOTAL
									S	SSW	SW						
47	47	1	5	18	0	5	15	11	5	11	3	18	3	9	37	0	
GT 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40. - 50. :	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. - 20. :	1	0	0	1	0	0	1	2	0	1	0	1	0	0	0	0	7
LT 10. :	15	9	7	15	30	59	60	43	87	114	94	30	22	23	22	9	672
TOTAL :	17	9	7	16	30	59	61	45	87	115	94	31	22	23	23	9	681
MEAN CONC.	3	0	0	2	0	0	0	0	0	0	0	1	0	0	2	0	0

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

NITROGEN DIOXIDE (NO2)										C-B SHALE OIL PROJECT									
TRAILER NO. - 23										PERIOD( 7/01/78 TO 7/31/78)									
CONCENTRATION MAX UG/M**3	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND S SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL		
	45	1	1	18	0	5	15	11	5	11	3	16	3	7	31	0			
GT 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
40. - 50. :	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1		
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
10. - 20. :	1	0	0	1	0	0	1	1	0	1	0	1	0	0	0	0	6		
LT 10. :	15	9	7	15	30	59	60	44	87	114	94	30	22	23	22	9	673		
TOTAL :	17	9	7	16	30	59	61	45	87	115	94	31	22	23	23	9	681		
MEAN CONC.	3	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0		

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

OZONE (O3)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 7/01/78 TO 7/31/78)

CONCENTRATION MAX UG/M**3	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION				W	WNW	NW	NNW	CALM	TOTAL
									S	SSW	SW	WSW						
GT 260. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240. - 260. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220. - 240. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200. - 220. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180. - 200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160. - 180. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140. - 160. :	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
120. - 140. :	0	1	0	0	0	0	2	0	16	24	22	6	1	1	4	1	0	78
100. - 120. :	10	1	1	2	5	14	20	17	24	43	38	8	8	11	14	12	2	230
80. - 100. :	6	4	5	10	13	33	35	20	28	38	25	17	17	4	5	7	7	274
60. - 80. :	1	3	1	4	9	10	3	7	10	6	8	2	4	4	0	2	0	74
40. - 60. :	0	0	0	0	3	2	1	1	8	2	0	0	1	1	0	1	0	20
20. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LT 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL :	17	9	7	16	30	59	61	45	86	115	93	33	31	21	23	23	9	678
MEAN CONC.	101	90	89	93	85	91	96	94	97	106	106	104	95	98	111	100	94	99

0 = NO OBSERVATIONS



NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

SULFUR DIOXIDE (SO2)										C-B SHALE OIL PROJECT									
TRAILER NO. - 23 PERIOD( 7/01/78 TO 7/31/78)																			
CONCENTRATION MAX UG/M**3	N	NNE	NE	ENE	E	ESE	SE	WIND DIRECTION				WSW	W	WNW	NW	NNW	CALM	TOTAL	
								SSE	S	SSW	SW								
GT 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. - 20. :	0	0	1	0	6	4	1	4	13	23	8	0	2	0	0	0	0	0	62
LT 10. :	17	9	6	15	23	48	57	39	70	84	84	33	28	21	22	23	9	588	
TOTAL :	17	9	7	15	29	52	58	43	83	107	92	33	30	21	22	23	9	650	
MEAN CONC.	0	1	3	1	2	1	0	1	3	3	2	0	1	0	0	0	1	1	

0 = NO OBSERVATIONS

Table II B-28

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## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

HYDROGEN SULFIDE (H<sub>2</sub>S)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 7/01/78 TO 7/31/78)

CONCENTRATION MAX UG/M**3	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION			WSW	W	WNW	NW	NNW	CALM	TOTAL
									S	SSW	SW							
GT 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. - 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LT 10. :	17	9	7	16	29	52	58	43	84	108	92	33	30	22	22	24	9	655
TOTAL :	17	9	7	16	29	52	58	43	84	108	92	33	30	22	22	24	9	655
MEAN CONC.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

0 = NO OBSERVATIONS

NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

TOTAL HYDROCARBONS (THC)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 7/01/78 TO 7/31/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																TOTAL			
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL		
4518 4584 2553 4977 4846 4977 4453 3955 4257 3536 4846 2881 4781 4715 4912 3405 2226																				
GT 4000. :	1	1	0	1	2	3	2	0	1	0	1	0	2	3	2	0	0 :	19		
3800. -4000. :	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0 :	3		
3600. -3800. :	0	0	0	1	0	0	1	0	1	0	1	0	0	1	1	0	0 :	6		
3400. -3600. :	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	1	0 :	5		
3200. -3400. :	1	0	0	0	0	2	1	1	0	0	0	0	0	0	0	1	0 :	6		
3000. -3200. :	1	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0 :	4		
2800. -3000. :	0	0	0	1	1	2	1	0	1	0	0	1	0	0	0	1	0 :	8		
2600. -2800. :	0	0	0	0	0	1	1	1	1	0	0	0	1	0	0	1	0 :	6		
2400. -2600. :	0	0	1	0	1	0	2	3	0	3	0	1	0	1	0	2	0 :	14		
2200. -2400. :	1	1	0	0	1	3	1	1	0	0	1	0	0	0	1	2	1 :	13		
2000. -2200. :	2	2	0	0	0	0	1	0	9	3	7	2	0	1	3	1	0 :	31		
1800. -2000. :	4	1	0	5	5	7	7	9	10	8	9	2	5	2	3	2	1 :	80		
1600. -1800. :	0	0	0	1	4	2	2	2	4	3	15	5	5	4	0	0	0 :	47		
LT 1600. :	3	3	3	1	6	26	31	13	35	49	36	15	7	7	11	7	1 :	254		
TOTAL :	13	8	4	10	20	47	51	33	63	67	70	26	22	20	21	18	3	496		
MEAN CONC.	2146	2153	1195	2331	1987	1610	1551	1857	1549	1364	1601	1523	2030	2157	1839	1968	1702	1687		

0 = NO OBSERVATIONS



## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

METHANE (CH<sub>4</sub>)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 7/01/78 TO 7/31/78)

CONCENTRATION MAX UG/M**3	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION				W	WNW	NW	NNW	CALM	TOTAL
									S	SSW	SW	WSW						
2161	2095	1375	1964	1964	1964	1964	1964	1833	2095	1898	2095	2095	1964	2030	2226	2226	916	
GT 2600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
2400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
2200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0 :	2
2000. :	2	1	0	0	0	0	0	4	4	0	4	1	0	1	3	1	0 :	17
1800. :	4	1	0	2	4	3	2	4	4	4	3	1	2	2	3	2	0 :	41
1600. :	0	0	0	1	0	1	1	1	1	1	5	3	2	0	0	0	0 :	16
1400. :	0	0	0	0	1	4	5	6	6	2	4	1	2	0	0	0	0 :	31
1200. :	1	0	1	0	0	1	1	0	2	0	0	1	0	0	2	0	0 :	9
1000. :	1	2	1	0	1	2	4	2	0	1	5	1	3	2	5	5	0 :	35
800. :	3	3	0	3	9	12	16	11	18	23	31	9	6	6	4	6	1 :	161
600. :	0	0	0	0	2	8	5	2	13	25	14	4	1	1	0	0	0 :	75
400. :	0	0	0	0	0	7	4	2	7	10	1	2	1	1	0	0	0 :	35
200. :	0	0	0	0	0	0	0	0	2	2	1	0	0	0	1	0	0 :	6
LT 200. :	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0 :	1
TOTAL :	11	7	2	6	17	38	38	28	57	68	69	23	17	13	19	15	1	429
MEAN CONC.	1571	1272	1211	1419	1171	992	1045	1185	1059	864	1075	1130	1221	1158	1399	1283	916	1094

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## NON-METHANE HYDROCARBONS

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD: 7/01/78 TO 7/31/78)

CONCENTRATION MAX UG/M**3	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION				W	WNW	NW	NNW	CALM	TOTAL
									S	SSW	SW	WSW						
3536 3602	1505	3995	3798	3995	3995	3471	2947	3274	2553	3863	3602	3799	2422	2226				
GT 3000. :	1	1	0	1	2	3	2	0	1	0	3	3	2	0	0	0	0	20
2800. -3000. :	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	4
2600. -2800. :	0	0	0	0	0	0	1	1	0	1	0	1	1	0	0	0	0	6
2400. -2600. :	0	0	0	0	0	1	1	2	0	4	0	1	0	1	0	1	0	12
2200. -2400. :	1	1	0	0	1	5	1	1	0	0	0	0	0	1	1	1	1	12
2000. -2200. :	1	0	0	0	0	0	0	0	2	1	0	1	0	1	0	0	0	6
1800. -2000. :	0	0	0	1	1	2	2	1	1	0	0	1	0	0	0	0	1	11
1600. -1800. :	0	0	0	1	1	1	2	0	3	0	2	4	0	4	0	2	0	20
1400. -1600. :	0	0	1	0	0	0	2	2	1	0	0	2	0	0	0	3	0	11
1200. -1400. :	2	0	0	0	0	0	1	1	2	1	1	0	0	1	0	1	0	11
1000. -1200. :	0	0	0	0	1	0	1	0	2	0	4	0	1	0	1	1	0	10
800. -1000. :	0	1	0	1	4	2	3	1	4	4	8	0	0	0	0	0	0	30
600. - 800. :	0	1	0	0	2	2	6	2	9	20	11	3	0	1	0	0	0	57
LT 600. :	8	4	3	4	8	31	29	20	37	37	42	19	10	7	17	9	1	286
TOTAL :	13	8	4	10	20	47	51	33	63	67	70	26	22	20	21	18	3	496
MEAN CONC.	815	1039	589	1480	992	808	771	851	630	580	573	566	1137	1434	573	898	1397	768

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

CARBON MONOXIDE (CO)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD 7/01/78 TO 7/31/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION															
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
GT 4000. :	0	0	0	0	0	1	1	0	2	0	0	0	0	0	1	0
3750. -4000. :	0	0	0	0	2	0	1	1	1	0	0	1	0	0	0	1
3500. -3750. :	1	1	0	1	1	1	0	0	3	1	4	0	0	1	3	1
3250. -3500. :	3	0	0	1	0	1	1	1	1	0	2	1	1	2	1	0
3000. -3250. :	2	1	0	1	1	1	0	4	1	4	3	1	1	0	2	2
2750. -3000. :	0	0	0	0	0	1	0	1	1	0	3	2	2	0	0	0
2500. -2750. :	0	0	0	0	0	1	2	0	1	0	0	0	2	0	0	0
2250. -2500. :	1	0	1	0	2	0	2	1	2	1	2	0	0	0	1	0
2000. -2250. :	0	0	0	0	0	2	4	0	2	0	1	0	0	0	2	0
1750. -2000. :	0	0	0	0	1	7	3	2	3	4	6	1	0	1	2	2
1500. -1750. :	0	0	0	0	0	9	8	4	7	2	0	1	1	1	0	0
1250. -1500. :	0	0	0	0	1	2	4	2	2	8	4	2	0	0	3	1
1000. -1250. :	0	0	0	0	0	0	2	0	4	3	7	0	1	0	0	0
LT 1000. :	4	5	1	3	11	17	21	13	30	48	38	14	9	9	5	7
TOTAL :	11	7	2	6	19	43	49	29	60	71	70	23	17	14	20	14

MEAN  
CONC.

2153 1248 1322 1801 1482 1462 1297 1510 1445 1065 1310 1294 1346 1281 2052 1494 1034 1386

0 = NO OBSERVATIONS



# NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

C-B SHALE OIL PROJECT

NITRIC OXIDE (NO)

TRAILER NO. - 23 PERIOD( 8/01/78 TO 8/31/78)

[illegible]

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## OXIDES OF NITROGEN (NOX)

C-B SHALE OIL PRO

TRAILER NO. - 23 PERIOD( 8/01/78 TO 8/31/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	SSW	SW	WSW	W	WNW	NW	NNW	CALM	
GT 130. :	1	3	1	1	3	11	3	1	1	1	1	5	7	7	9	3	
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. - 20. :	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
LT 10. :	35	22	17	17	21	34	57	50	55	99	100	25	33	40	46	24	724
TOTAL :	35	22	17	17	21	35	57	50	55	99	100	25	33	40	46	24	725
MEAN CONC.	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## NITROGEN DIOXIDE (NO2)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 8/01/78 TO 8/31/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																NW	NNW	CALM	TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	3	5				
GT 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10. - 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
LT 10. :	35	22	17	17	21	35	57	50	55	99	100	49	25	33	40	46	24	725		
TOTAL :	35	22	17	17	21	35	57	50	55	99	100	49	25	33	40	46	24	725		
MEAN CONC.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

0 = NO OBSERVATIONS



## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

OZONE (O3)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 8/01/78 TO 8/31/78)

CONCENTRATION MAX UG/M**3	N 147	NNE 133	NE 123	ENE 127	E 127	ESE 137	SE 123	SSE 131	S 123	WIND DIRECTION				WSW 143	W 143	WNW 141	NW 147	NNW 160	CALM 117	TOTAL
										SSW	S	SSW	SW							
GT 260. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240. - 260. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220. - 240. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200. - 220. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180. - 200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160. - 180. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140. - 160. :	3	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	11	0	20
120. - 140. :	6	2	1	3	2	3	1	7	3	14	42	22	2	2	2	3	4	9	0	124
100. - 120. :	7	3	2	4	5	6	7	11	26	64	48	16	5	5	5	5	6	9	9	253
80. - 100. :	18	12	12	6	6	17	38	20	22	19	9	9	2	13	2	13	24	13	8	248
60. - 80. :	3	3	3	3	7	6	10	8	1	3	4	1	10	5	10	5	5	3	5	80
40. - 60. :	0	1	0	1	2	3	1	3	3	1	0	0	4	5	4	5	1	1	1	27
20. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
LT 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL :	37	21	18	17	22	35	57	49	55	101	104	49	26	32	26	32	42	47	23	735
MEAN CONC.	107	96	93	97	90	90	90	94	101	107	116	116	82	89	82	89	97	116	94	102

0 = NO OBSERVATIONS

NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

SULFUR DIOXIDE (SO2)

C-8 SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 8/01/78 TO 8/31/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																TOTAL			
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL		
GT 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
10. - 20. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
LT 10. :	36	23	18	17	23	36	57	50	55	99	104	49	25	31	42	47	24	736		
TOTAL :	36	23	18	17	23	36	57	50	55	99	104	49	25	31	42	47	24	736		
MEAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
CONC.																				

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

HYDROGEN SULFIDE (H2S)										C-B SHALE OIL PROJECT									
TRAILER NO. - 23 PERIOD( 8/01/78 TO 8/31/78)																			
CONCENTRATION MAX UG/M**3	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION SSW S SW	WSW	W	WNW	NW	NNW	CALM	TOTAL			
GT 130. :	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	13			
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10. - 20. :	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1			
LT 10. :	37	22	18	17	23	35	57	50	54	99	103	49	24	33	42	46	23	732	
TOTAL :	37	22	18	17	23	35	57	50	55	99	103	49	24	33	42	46	24	734	
MEAN CONC.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

0 = NO OBSERVATIONS



## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

TOTAL HYDROCARBONS (THC)															C-B SHALE OIL PROJECT																				
TRAILER NO. - 23 PERIOD( 8/01/78 TO 8/31/78)																																			
		N		NNE		NE		ENE		E		ESE		SE		SSE		WIND DIRECTION		SW		WSW		W		WNW		NW		NNW		CALM		TOTAL	
		1112		1112		1112		1047		1047		1833		3995		1047		982		1112		1047		1112		1047		1112		1243		4453		3863	
CONCENTRATION		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		1	
MAX		0		0		0		0		0		0		1		0		0		0		0		0		0		0		0		0		1	
UG/M**3		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
GT 4000. :		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
3800. -4000. :		0		0		0		0		0		0		1		0		0		0		0		0		0		0		0		0		2	
3600. -3800. :		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
3400. -3600. :		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
3200. -3400. :		0		0		0		0		0		0		1		0		0		0		0		0		0		0		0		0		1	
3000. -3200. :		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
2800. -3000. :		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
2600. -2800. :		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
2400. -2600. :		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
2200. -2400. :		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
2000. -2200. :		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
1800. -2000. :		0		0		0		0		0		1		0		0		0		0		0		0		0		0		0		0		1	
1600. -1800. :		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0	
LT 1600. :		35	22	16	13	19	32	45	45	53	98	93	42	25	26	33	20	652																	
TOTAL :		35	22	16	13	19	33	47	45	53	98	93	42	25	26	34	21	657																	
MEAN CONC.		976	973	932	941	947	968	1021	921	940	868	825	835	956	969	989	1074	1050	933																

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

METHANE (CH<sub>4</sub>)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 8/01/78 TO 8/31/78)

CONCENTRATION MAX UG/M**3	N		NNE		NE		ENE		E		ESE		SE		SSE		WIND DIRECTION				WSW		W		WNW		NW		NNW		CALM		TOTAL
	1047	1047	1047	1047	1047	1047	1047	1047	1047	1047	1047	982	982	982	982	SSW	S	SSW	SW	982	1047	982	1047	982	1047	1440	1047	1047	1047	1047			
GT 2600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2400. -2600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2200. -2400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2000. -2200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1800. -2000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1600. -1800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1400. -1600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
1200. -1400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1000. -1200. :	5	3	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	2	0	1	0	2	0	2	2	2	4	1	0	1	1	24	
800. -1000. :	29	19	15	12	18	27	41	37	47	62	79	79	62	26	22	22	22	31	29	22	22	22	31	29	17	17	17	17	17	17	533	0	
600. - 800. :	0	0	1	0	3	6	9	9	9	19	9	9	19	11	1	1	0	0	0	1	1	1	0	0	0	3	3	3	3	3	79	0	
400. - 600. :	0	0	0	0	0	0	0	0	0	0	0	1	0	2	1	0	1	0	0	2	1	0	1	0	0	0	0	0	0	0	6	0	
200. - 400. :	0	0	0	0	0	0	0	0	0	0	0	7	12	2	1	0	0	0	0	2	1	0	0	0	0	1	0	0	1	1	24	0	
LT 200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	2	1	0	0	0	0	0	0	3	0	
TOTAL :	34	22	17	13	22	34	50	47	54	98	98	93	42	25	27	27	36	33	33	22	22	33	33	22	22	36	931	942	874	874	871	669	
MEAN CONC.	949	937	928	911	907	895	882	874	882	882	833	787	815	893	875	931	942	874	871	669	0	0	0	0	0	0	0	0	0	0	0	0	0

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

NON-METHANE HYDROCARBONS													C-B SHALE OIL PROJECT									
TRAILER NO. - 23 PERIOD( 8/01/78 TO 8/31/78)																						
CONCENTRATION MAX UG/M**3	N	NNE	NE	ENE	E	ESE	SE	WIND DIRECTION				WSW	W	WNW	NW	NNW	CALM	TOTAL				
								SSE	S	SSW	SW											
GT 3000. :	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	2				
2800. -3000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1				
2600. -2800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
2400. -2600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
2200. -2400. :	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1				
2000. -2200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1800. -2000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1600. -1800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1400. -1600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1200. -1400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1000. -1200. :	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3				
800. -1000. :	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	3				
600. - 800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2				
LT 600. :	34	21	16	13	19	32	45	45	53	98	92	42	25	25	33	32	20	645				
TOTAL :	35	22	16	13	19	33	47	45	53	98	93	42	25	26	35	34	21	657				
MEAN CONC.	54	77	8	30	34	73	143	49	58	34	48	70	62	100	101	159	180	71				

0 = NO OBSERVATIONS



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## C-B SHALE OIL PROJECT

CARBON MONOXIDE (CO)

TRAILER NO. - 23 PERIOD( 8/01/78 TO 3/31/78)

CONCENTRATION MAX UG/M**3	N		NNE		NE		ENE		E		ESE		SE		SSE		WIND DIRECTION				WSW		W		WNW		NW		NNW		CALM		TOTAL
	345	229	229	1150	345	345	345	345	690	575	345	345	345	345	345	345	SSW	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW		
GT 4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3750. -4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3500. -3750. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3250. -3500. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3000. -3250. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2750. -3000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2500. -2750. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2250. -2500. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2000. -2250. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1750. -2000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1500. -1750. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1250. -1500. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1000. -1250. :	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
LT 1000. :	26	20	16	10	17	28	46	38	56	50	22	20	23	31	23	20	23	31	23	20	23	31	23	20	23	31	23	20	23	31	20	479	
TOTAL :	26	20	16	11	17	28	46	38	56	50	22	20	23	31	24	20	23	31	24	20	23	31	24	20	23	31	24	20	23	31	20	481	
MEAN	163	149	136	240	142	176	169	199	168	147	156	172	229	174	210	172	229	174	210	149	170												

0 = NO OBSERVATIONS

# NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

0 = NO OBSERVATIONS

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NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

OXIDES OF NITROGEN (NOX)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 9/01/78 TO 9/30/78)

[illegible]

0 = NO OBSERVATIONS



## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## NITROGEN DIOXIDE (NO2)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD 9/01/78 TO 9/30/78

CONCENTRATION MAX UG/M**3	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION				W	WNW	NW	NNW	CALM	TOTAL
									S	SSW	SW	WSW						
15	9	3	0	0	0	0	0	5	0	1	7	0	1	9	15	7	7	
GT 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
10. - 20. :	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0 :	2
LT 10. :	45	29	9	20	18	22	21	38	50	90	53	68	36	36	34	37	48 :	654
TOTAL :	46	29	9	20	18	22	21	38	50	90	53	68	36	36	35	37	48	656
MEAN CONC.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

OZONE (03)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 9/01/78 TO 9/30/78)

CONCENTRATION MAX UG/M**3	N	NNE	NE	ENE	E	ESE	SE	WIND DIRECTION				WSW	W	WNW	NW	NNW	CALM	TOTAL
								SSE	S	SSW	SW							
107	107	131	88	111	117	113	103	117	117	152	147	123	121	123	107	113	129	
GT 260. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
240. - 260. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
220. - 240. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
200. - 220. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
180. - 200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
160. - 180. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
140. - 160. :	0	0	0	0	0	0	0	0	0	5	1	0	0	0	0	0	0 :	6
120. - 140. :	0	1	0	0	0	0	0	0	0	8	1	2	1	1	0	0	1 :	15
100. - 120. :	2	0	0	2	1	9	3	13	14	23	15	4	2	4	2	3	9 :	106
80. - 100. :	14	9	1	8	6	7	8	12	18	31	16	39	17	9	15	15	10 :	235
60. - 80. :	21	15	6	9	7	6	10	9	15	28	14	11	8	13	12	18	19 :	221
40. - 60. :	9	4	1	2	5	2	2	7	3	1	6	8	7	9	5	1	10 :	82
20. - 40. :	0	0	0	0	0	1	0	0	1	1	1	1	0	0	0	0	0 :	5
LT 20. :	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0 :	1
TOTAL :	46	29	8	21	19	25	23	41	51	97	54	66	35	36	34	37	49	671
MEAN CONC.	73	75	71	79	77	86	82	86	95	86	85	79	76	78	79	79	79	83

0 = NO OBSERVATIONS





## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

HYDROGEN SULFIDE (H2S)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 9/01/78 TO 9/30/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION											
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW
	W	WNW	NW	NNW	CALM	TOTAL						
GT 130. :	0	0	0	0	0	0	0	0	0	0	0	0
120. - 130. :	0	0	0	0	0	0	0	0	0	0	0	0
110. - 120. :	0	0	0	0	0	0	0	0	0	0	0	0
100. - 110. :	0	0	0	0	0	0	0	0	0	0	0	0
90. - 100. :	0	0	0	0	0	0	0	0	0	0	0	0
80. - 90. :	0	0	0	0	0	0	0	0	0	0	0	0
70. - 80. :	0	0	0	0	0	0	0	0	0	0	0	0
60. - 70. :	0	0	0	0	0	0	0	0	0	0	0	0
50. - 60. :	0	0	0	0	0	0	0	0	0	0	0	0
40. - 50. :	0	0	0	0	0	0	0	0	0	0	0	0
30. - 40. :	0	0	0	0	0	0	0	0	0	0	0	0
20. - 30. :	0	0	0	0	0	0	0	0	0	0	0	0
10. - 20. :	0	0	0	0	0	0	0	0	0	0	0	0
LT 10. :	46	29	9	20	18	22	21	38	50	88	53	67
TOTAL :	46	29	9	20	18	22	21	38	50	88	53	67
MEAN CONC.	0	0	0	0	0	0	0	0	0	0	0	0

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## TOTAL HYDROCARBONS (THC)

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 9/01/78 TO 9/30/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																NW	NNW	CALM	TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW						
	0	982	0	982	982	0	0	0	785	1112	785	0	0	0	0	0	0	1047		
GT 4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0	
3800. -4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0	
3600. -3800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0	
3400. -3600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0	
3200. -3400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0	
3000. -3200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0	
2800. -3000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0	
2600. -2800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0	
2400. -2600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0	
2200. -2400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0	
2000. -2200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0	
1800. -2000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0	
1600. -1800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0	
LT 1600. :	0	2	0	2	1	0	0	0	1	2	2	0	0	0	0	0	0	2 :	12	
TOTAL :	0	2	0	2	1	0	0	0	1	2	2	0	0	0	0	0	0	2	12	
MEAN CONC.	0	982	0	982	982	0	0	0	785	1014	752	0	0	0	0	0	0	1015	938	

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

METHANE (CH<sub>4</sub>)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 9/01/78 TO 9/30/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION															
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
	0	916	0	916	916	0	0	0	523	916	523	196	0	0	0	0
GT 2600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2400. -2600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200. -2400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000. -2200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800. -2000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600. -1800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400. -1600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200. -1400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000. -1200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800. -1000. :	0	2	0	2	1	0	0	0	0	2	0	0	0	0	0	0
600. - 800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400. - 600. :	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
200. - 400. :	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
LT 200. :	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
TOTAL :	0	2	0	2	1	0	0	0	1	2	2	1	0	0	0	2
MEAN CONC.	0	916	0	883	916	0	0	0	523	916	425	196	0	0	0	916
																750

0 = NO OBSERVATIONS



## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

## NON-METHANE HYDROCARBONS

## C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 9/01/78 TO 9/30/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION															
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
GT 3000. :	0	66	0	130	66	0	0	0	261	196	392	0	0	0	0	0
2800. -3000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2600. -2800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2400. -2600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200. -2400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000. -2200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800. -2000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600. -1800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400. -1600. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200. -1400. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000. -1200. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800. -1000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600. - 800. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LT 600. :	0	2	0	2	1	0	0	0	1	2	2	0	0	0	0	0
TOTAL :	0	2	0	2	1	0	0	0	1	2	2	0	0	0	0	0
MEAN	0	66	0	98	66	0	0	0	261	98	327	0	0	0	0	0
CONC.	0	66	0	98	66	0	0	0	261	98	327	0	0	0	0	0

0 = NO OBSERVATIONS

## NUMBER OF ONE HOUR SAMPLES BY WIND DIRECTION AND LEVEL

CARBON MONOXIDE (CO)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD( 9/01/78 TO 9/30/78)

CONCENTRATION MAX UG/M**3	WIND DIRECTION																C-B SHALE OIL PROJECT			
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL		
459	345	229	0	115	115	0	115	115	115	115	115	115	115	0	229	345	0			
GT 4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
3750. -4000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
3500. -3750. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
3250. -3500. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
3000. -3250. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2750. -3000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2500. -2750. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2250. -2500. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2000. -2250. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1750. -2000. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1500. -1750. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1250. -1500. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1000. -1250. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
LT 1000. :	38	23	8	10	12	9	14	16	14	14	37	33	29	27	28	31	33	411		
TOTAL :	38	23	8	10	12	9	14	16	14	14	37	33	29	27	28	31	33	411		
MEAN CONC.	75	94	28	0	9	12	0	7	16	18	13	9	7	0	53	48	0	26		

0 = NO OBSERVATIONS

TABLE II B-31

METEOROLOGICAL SUMMARY: VECTOR MONTHLY AVERAGES FOR WINDS  
(10 Meter Level)  
STATION 023

Item	By Month											
	(1976 - 1977)						(1977 - 1978)					
	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
Wind Speed (mps)	0.5	1.0	1.4	0.8	1.7	0.9	3.1	1.8	2.5	1.2	2.0	1.0
Wind Direction (Deg.)	237.4	200.4	189.6	251.3	217.3	231.7	200.8	213.1	205.9	222.0	200.0	190.0

Item	By Month											
	(1977 - 1978)						(1977 - 1978)					
	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
Wind Speed (mps)	2.0	3.0	2.0	2.0	2.0	2.0	2.0					
Wind Direction (Deg.)	205.0	215.0	190.0	185.0	185.0	210.0	200.0					



TABLE II B-32

METEOROLOGICAL SUMMARY: WIND SPEED & DIRECTION  
 Station 023  
 (10 Meter Height)  
 (1976 - 1977)

ITEM	MONTH											
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT
Wind Speed, Hourly Max. (mps)	8.0	11.0	8.0	11.0	11.0	10.0	15.0	9.0	11.0	9.0	11.0	9.0
Associated Direction (Deg.)	221.0	176.0	87.0*	190.0	78.7*	195.0	190.0	238.5*	182.0	217.5*	205.0	206.9
Wind Speed, Hourly Avg. (mps)	2.0	2.0	2.0	2.0	4.0	3.0	4.0	4.0	4.0	3.0	3.0	2.0
Wind Direction Hourly Avg. (Deg.)	205.0	187.0	175.0	229.0	210.0	220.0	200.0	203.0	200.0	205.0	195.0	190.0

(1977 - 1978)

ITEM	MONTH											
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT
Wind Speed, Hourly Max. (mps)	11.0	10.0	11.0	9.0	9.0	12.0	13.0	13.0	11.0	13.0	16.0	
Associated Direction (Deg.)	195.0	200.6	180.0	215.0	215.0	205.0	195.0	210.0	180.0	240.0	259.0	
Wind Speed, Hourly Avg. (mps)	3.0	3.0	3.0	2.0	3.0	2.0	4.0	4.0	4.0	4.0	3.0	
Wind Direction Hourly Avg. (Deg.)	205.0	205.0	195.0	185.0	155.0	195.0	205.0	235.0	198.0	206.0	237.0	

\* Maximum wind speed was reached > 1 time. Associated Direction was computed as vector mean.

## FREQUENCY TABLE OF WIND SPEED BY DIRECTION

10 METER LEVEL

C-B SHALE OIL PROJECT

METEOROLOGICAL TOWER PERIOD( 2/01/78 TO 2/28/78)

WIND SPEED MAX METERS/SEC	WIND DIRECTION																	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL
GT 11. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8. - 11. :	0	0	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	4
5. - 8. :	0	0	0	0	0	0	0	2	13	21	15	1	0	1	0	0	0	53
3. - 5. :	4	1	0	0	0	1	5	13	20	41	29	1	2	9	9	6	3	144
1. - 3. :	7	5	3	5	16	26	53	24	34	38	25	5	10	12	13	11	23	310
LT 1. :	2	4	3	3	8	8	15	13	12	9	9	2	8	4	3	3	12	118
TOTAL :	13	10	6	8	24	35	73	52	80	109	81	9	20	26	25	20	38	629
PERCENT	2.	2.	1.	1.	4.	6.	12.	8.	13.	17.	13.	1.	3.	4.	4.	3.	6.	100.

Table II B-33

Page 2 of 3

## FREQUENCY TABLE OF WIND SPEED BY DIRECTION

30 METER LEVEL		METEOROLOGICAL TOWER PERIOD( 2/01/78 TO 2/28/78)												C-B SHALE OIL PROJECT			
		WIND DIRECTION															
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	NW	NNW	CALM	TOTAL
WIND SPEED MAX METERS/SEC		2	4	1	2	2	4	5	7	8	8	6	4	5	4	5	4
GT 11. :		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8. - 11. :		0	0	0	0	0	0	0	0	2	7	0	0	0	0	0	0
5. - 8. :		0	0	0	0	0	0	1	11	22	40	5	0	1	2	0	84
3. - 5. :		0	1	0	0	0	3	22	19	28	48	16	5	4	9	10	179
1. - 3. :		6	4	9	6	12	23	47	33	32	22	15	8	16	15	8	288
LT 1. :		4	1	4	3	2	2	6	1	4	4	5	3	2	3	1	53
TOTAL :		10	6	13	9	14	28	76	64	83	121	41	16	23	29	18	25
		.....															
PERCENT		2.	1.	2.	1.	2.	5.	12.	10.	14.	20.	7.	3.	4.	5.	3.	4.



Page 3 of 3

C-B SHALE OIL PROJECT

II B-113

## 10 METER LEVEL

C-B SHALE OIL PROJECT

METEOROLOGICAL TOWER PERIOD( 3/01/78 TO 3/31/78)

WIND SPEED MAX METERS/SEC	WIND DIRECTION																		TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM		
GT 11 :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8 - 11 :	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2	
5 - 8 :	0	0	0	0	0	0	1	0	14	13	3	0	0	0	0	0	0	31	
3 - 5 :	8	2	1	0	0	0	3	5	33	50	27	3	1	1	8	3	2	147	
1 - 3 :	10	7	7	4	12	25	40	33	32	32	21	10	11	19	24	16	8	311	
LT 1 :	6	4	5	9	8	16	22	12	14	14	8	7	3	6	5	8	15	162	
TOTAL :	24	13	13	13	20	41	66	50	94	109	60	20	15	26	37	27	25	653	
PERCENT	4.	2.	2.	2.	3.	6.	10.	8.	14.	17.	9.	3.	2.	4.	6.	4.	4.	100.	

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## C-B SHALE OIL PROJECT

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FREQUENCY TABLE OF WIND SPEED BY DIRECTION

C-B SHALE OIL PROJECT

METEOROLOGICAL TOWER PERIOD( 3/01/78 TO 3/31/78)

WIND SPEED MAX METERS/SEC	WIND DIRECTION																		TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM		
GT 11. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8. - 11. :	0	0	0	0	0	0	0	0	5	5	2	0	0	0	0	0	0	12	
5. - 8. :	0	1	0	0	0	0	3	0	15	28	8	1	0	2	0	1	0	59	
3. - 5. :	4	4	1	0	0	2	5	14	33	61	27	4	2	6	13	9	5	190	
1. - 3. :	2	9	4	8	7	9	30	28	46	45	18	14	18	34	28	19	11	330	
LT 1. :	0	2	7	5	7	7	7	7	8	6	11	5	3	9	4	3	12	103	
TOTAL :	6	16	12	13	14	18	45	49	107	145	66	24	23	51	45	32	28	694	
PERCENT	1.	2.	2.	2.	2.	3.	6.	7.	15.	21.	10.	3.	3.	7.	6.	5.	4.	100.	

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C-B SHALE OIL PROJECT

0 = NO OBSERVATIONS

## FREQUENCY TABLE OF WIND SPEED BY DIRECTION

10 METER LEVEL		METEOROLOGICAL TOWER PERIOD( 4/01/78 TO 4/30/78)											C-B SHALE OIL PROJECT						
WIND SPEED MAX METERS/SEC		WIND DIRECTION																	
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL
7		4	3	1	1	2	3	4	11	9	10	8	4	8	6	7			
GT 11. :		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
8. - 11. :		0	0	0	0	0	0	0	2	14	4	1	0	1	0	1	0	0	23
5. - 8. :		3	0	0	0	0	0	0	35	39	25	7	0	5	4	4	4	4	126
3. - 5. :		2	3	1	0	0	0	6	12	52	30	18	13	9	26	13	13	3	201
1. - 3. :		4	5	5	4	3	11	18	11	31	28	25	19	20	11	11	6	11	223
LT 1. :		0	4	1	2	2	2	9	6	16	13	12	10	2	3	4	2	3	91
TOTAL :		9	12	7	6	5	13	33	29	137	124	84	50	31	46	33	25	21	665
.....																			
PERCENT		1.	2.	1.	1.	1.	2.	5.	4.	21.	19.	13.	8.	5.	7.	5.	4.	3.	100.



## FREQUENCY TABLE OF WIND SPEED BY DIRECTION

30 METER LEVEL				C-B SHALE OIL PROJECT															
				METEOROLOGICAL TOWER PERIOD( 4/01/78 TO 4/30/78)															
WIND SPEED MAX METERS/SEC		WIND DIRECTION																	
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	VNW	NW	NNW	CALM	TOTAL
GT 11. :	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
8. - 11. :	0	0	0	0	0	0	0	0	0	31	22	6	1	0	2	0	2	0	64
5. - 8. :	0	0	0	0	0	0	0	6	5	52	39	17	8	9	9	11	7	5	168
3. - 5. :	1	6	0	0	1	6	10	10	10	33	26	16	15	20	18	14	5	3	189
1. - 3. :	3	3	2	4	8	12	20	10	10	20	15	18	28	17	14	12	10	11	207
LT 1. :	1	3	3	1	3	4	2	6	6	4	3	4	7	4	4	4	1	3	57
TOTAL :	5	12	5	5	12	22	38	31	31	146	105	61	59	50	47	41	25	22	686
PERCENT	1.	2.	1.	1.	2.	3.	6.	5.	5.	21.	15.	9.	9.	7.	7.	6.	4.	3.	100.

## FREQUENCY TABLE OF WIND SPEED BY DIRECTION

60 METER LEVEL										C-B SHALE OIL PROJECT											
METEOROLOGICAL TOWER										PERIOD( 4/01/78 TO 4/30/78)											
		WIND DIRECTION																			
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL		
WIND SPEED MAX METERS/SEC		6	3	6	3	1	3	7	6	12	11	11	8	8	9	8	8	7			
GT 11. :		0	0	0	0	0	0	0	0	3	1	1	0	0	0	0	0	0 :	5		
8. - 11. :		0	0	0	0	0	0	0	0	25	34	8	2	1	2	1	3	0 :	76		
5. - 8. :		1	0	1	0	0	0	6	6	41	55	30	10	6	11	8	13	2 :	190		
3. - 5. :		2	2	3	1	0	1	13	8	23	15	24	14	22	18	23	5	3 :	177		
1. - 3. :		4	5	3	6	3	11	17	9	16	12	10	24	30	18	13	7	8 :	196		
LT 1. :		3	2	0	0	3	1	2	5	10	3	2	0	6	6	9	1	0 :	53		
TOTAL :		10	9	7	7	6	13	38	28	118	120	75	50	65	55	54	29	13	697		
.....																					
PERCENT		1.	1.	1.	1.	1.	2.	5.	4.	17.	17.	11.	7.	9.	8.	8.	4.	2.	100.		

Table II B-36:

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## FREQUENCY TABLE OF WIND SPEED BY DIRECTION

10 METER LEVEL		STATION AB20 PERIOD( 5/01/78 TO 5/31/78)												C-E SHALE OIL PROJECT			
		WIND DIRECTION															
WIND SPEED MAX METERS/SEC		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	NW	NNW	CALM	TOTAL
		3	1	3	2	5	4	6	6	7	6	6	3	8	7	5	5
GT 11. :		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8. - 11. :		0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	5
5. - 8. :		0	0	0	0	1	0	3	4	29	10	11	2	3	7	2	73
3. - 5. :		2	0	1	0	6	27	34	6	20	14	18	3	15	28	15	226
1. - 3. :		4	2	3	4	47	101	37	3	4	9	10	2	18	22	6	303
LT 1. :		1	1	1	6	14	14	0	0	0	0	1	0	1	0	1	47
TOTAL :		7	3	5	10	68	142	74	13	53	33	40	8	33	57	24	659
PERCENT		1.	0.	1.	2.	10.	22.	11.	2.	3.	5.	6.	1.	6.	9.	4.	100.

0 = NO OBSERVATIONS



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## C-B SHALE OIL PROJECT

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10 METER LEVEL

C-B SHALE OIL PROJECT

STATION AB20 PERIOD( 6/01/78 TO 6/30/78)

WIND SPEED MAX METERS/SEC		WIND DIRECTION																	TOTAL
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	
CT	11. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8. -	11. :	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	2
5. -	8. :	0	0	0	0	0	2	4	2	12	14	24	8	1	11	6	0	0	86
3. -	5. :	8	2	0	0	16	30	45	9	20	27	34	6	17	17	13	1	5	250
1. -	3. :	4	2	5	2	80	85	43	10	2	6	4	1	8	13	10	3	11	280
LT	1. :	0	0	0	1	6	1	1	0	0	0	0	0	0	1	0	0	0	10
TOTAL :		12	4	5	3	102	118	94	21	34	47	62	15	26	43	31	4	16	637
PERCENT		2.	1.	1.	0.	16.	19.	15.	3.	5.	7.	10.	2.	4.	7.	5.	1.	3.	100.

0 = NO OBSERVATIONS

Table II B-37

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## FREQUENCY TABLE OF WIND SPEED BY DIRECTION

10 METER LEVEL		METEOROLOGICAL TOWER											PERIOD( 6/01/78 TO 6/30/78)											C-B SHALE OIL PROJECT			
		WIND DIRECTION																									
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL								
WIND SPEED MAX		5	6	4	4	7	8	5	5	9	13	12	5	5	7	7	8	3									
METERS/SEC																											
GT 11. :		0	0	0	0	0	0	0	0	0	4	2	0	0	0	0	0	0	6								
8. - 11. :		0	0	0	0	0	1	0	0	8	42	18	0	0	0	0	2	0	71								
5. - 8. :		1	2	0	0	1	0	1	2	26	64	25	1	1	9	11	9	0	153								
3. - 5. :		7	2	2	2	2	7	5	8	48	37	10	8	7	11	18	14	1	189								
1. - 3. :		16	4	5	12	12	19	8	10	12	24	27	15	15	22	24	18	7	250								
LT 1. :		8	5	4	1	1	2	2	3	2	4	2	2	2	3	2	3	2	48								
TOTAL :		32	13	11	15	16	29	16	23	96	175	84	26	25	45	55	46	10	717								
.....																											
PERCENT		4.	2.	2.	2.	2.	4.	2.	3.	13.	24.	12.	4.	3.	6.	8.	6.	1.	100.								

0 = NO OBSERVATIONS



## FREQUENCY TABLE OF WIND SPEED BY DIRECTION

30 METER LEVEL

C-B SHALE OIL PROJECT

METEOROLOGICAL TOWER PERIOD( 6/01/78 TO 6/30/78)

## WIND DIRECTION

WIND SPEED MAX METERS/SEC	WIND DIRECTION																TOTAL		
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL	
GT 11. :	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0 :	2
8. - 11. :	0	0	0	0	1	0	0	0	5	29	20	1	0	0	1	1	0	0 :	58
5. - 8. :	3	0	0	0	1	0	1	4	33	91	30	0	2	4	8	4	0	0 :	181
3. - 5. :	4	1	0	1	4	12	4	10	29	33	14	2	10	18	18	13	2	2 :	175
1. - 3. :	16	8	8	2	9	18	5	16	18	10	12	19	25	24	34	19	2	2 :	245
LT 1. :	4	1	5	2	9	6	3	1	3	3	1	3	2	6	2	1	5	5 :	57
TOTAL :	27	10	13	5	24	36	13	31	88	167	78	25	39	52	63	38	9	718	
PERCENT	4.	1.	2.	1.	3.	5.	2.	4.	12.	23.	11.	3.	5.	7.	9.	5.	1.	100.	

0 = NO OBSERVATIONS

Table II B-37

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## FREQUENCY TABLE OF WIND SPEED BY DIRECTION

60 METER LEVEL		METEOROLOGICAL TOWER PERIOD( 6/01/78 TO 6/30/78)												C-B SHALE OIL PROJECT					
		WIND DIRECTION																	
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL
WIND SPEED MAX METERS/SEC		8	3	3	4	4	8	6	7	9	11	13	8	7	6	8	8	3	
GT 11. :		0	0	0	0	0	0	0	0	0	2	6	0	0	0	0	0	0	8
8. - 11. :		1	0	0	0	0	1	0	0	9	30	49	2	0	0	2	1	0	95
5. - 8. :		2	0	0	0	0	2	2	5	13	66	67	4	1	5	12	7	0	186
3. - 5. :		9	2	1	3	3	4	10	10	8	25	16	3	6	20	23	19	1	163
1. - 3. :		10	6	4	3	7	6	8	10	8	16	9	18	20	24	34	17	3	203
LT 1. :		3	7	5	1	4	3	6	1	3	5	5	5	2	3	4	1	4	62
TOTAL :		25	15	10	7	14	16	26	26	41	144	152	32	29	52	75	45	8	717
.....																			
PERCENT		3.	2.	1.	1.	2.	2.	4.	4.	6.	20.	21.	4.	4.	7.	10.	6.	1.	100.

0 = NO OBSERVATIONS

Page 1 of 4

FREQUENCY TABLE OF WIND SPEED BY DIRECTION

10 METER LEVEL

C-B SHALE OIL PROJECT

STATION AB20 PERIOD( 7/01/78 TO 7/31/78)

WIND SPEED MAX METERS/SEC		WIND DIRECTION																		TOTAL
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM		
GT	11. :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8. -	11. :	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
5. -	8. :	1	0	0	1	2	3	1	0	5	2	1	3	6	1	1	0	0	27	
3. -	5. :	2	0	2	1	17	37	11	10	28	18	21	11	13	11	7	0	2	196	
1. -	3. :	11	4	9	65	134	44	14	2	8	2	10	3	14	12	3	5	10	350	
LT	1. :	0	0	2	6	7	1	1	1	0	0	0	0	2	0	1	0	2	23	
TOTAL :		14	4	13	73	160	85	27	13	41	22	32	17	41	24	12	5	14	597	
PERCENT		2.	1.	2.	12.	27.	14.	5.	2.	7.	4.	5.	3.	7.	4.	2.	1.	2.	100.	

0 = NO OBSERVATIONS



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# FREQUENCY TABLE OF WIND SPEED BY DIRECTION

10 METER LEVEL

C-B SHALE OIL PROJECT

METEOROLOGICAL TOWER PERIOD( 7/01/78 TO 7/31/78)

WIND SPEED MAX METERS/SEC	WIND DIRECTION																		TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM		
GT 11. :	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
8. - 11. :	0	0	0	0	0	0	1	3	5	9	7	2	0	0	0	0	0	27	
5. - 8. :	4	2	0	0	0	0	3	6	32	55	37	5	5	2	6	6	0	163	
3. - 5. :	11	6	6	3	5	12	14	11	23	35	26	7	14	9	18	6	1	207	
1. - 3. :	13	2	8	18	30	31	22	19	22	13	15	10	14	7	12	12	6	254	
LT 1. :	6	3	3	2	2	2	1	1	2	5	1	3	3	6	3	3	1	47	
TOTAL :	34	13	17	23	37	45	41	40	85	117	86	27	36	24	39	27	8	699	
.....																			
PERCENT	5.	2.	2.	3.	5.	6.	6.	6.	12.	17.	12.	4.	5.	3.	6.	4.	1.	100.	

0 = NO OBSERVATIONS

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## C-B SHALE OIL PROJECT

0 = NO OBSERVATIONS

Table II B-38

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## FREQUENCY TABLE OF WIND SPEED BY DIRECTION

60 METER LEVEL										C-B SHALE OIL PROJECT									
METEOROLOGICAL TOWER										PERIOD( 7/01/78 TO 7/31/78)									
WIND SPEED MAX METERS/SEC		WIND DIRECTION																	
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL
GT 11. :		5	5	4	4	4	9	6	8	10	8	9	10	6	8	7	7	3	
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
8. - 11. :		0	0	0	0	0	1	0	2	5	10	14	2	0	1	0	0	0 :	35
5. - 8. :		2	1	0	0	0	1	7	7	12	58	59	5	7	2	5	1	0 :	167
3. - 5. :		14	3	5	2	6	6	27	17	22	27	36	17	11	7	18	11	3 :	232
1. - 3. :		6	5	6	5	9	22	25	27	13	16	15	15	14	14	6	11	3 :	212
LT 1. :		4	6	1	0	3	3	6	3	6	2	1	3	7	3	1	3	1 :	53
TOTAL :		26	15	12	7	18	33	65	56	58	113	125	42	39	27	30	26	7	699
.....																			
PERCENT		4.	2.	2.	1.	3.	5.	9.	8.	8.	16.	18.	6.	6.	4.	4.	4.	1.	100.

0 = NO OBSERVATIONS



C-B SHALE OIL PROJECT

10 METER LEVEL

STATION AB20 PERIOD( 8/01/78 TO 8/31/78)

WIND SPEED MAX METERS/SEC	WIND DIRECTION																		TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM		
GT 11 :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8 - 11 :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5 - 8 :	0	0	0	0	0	0	1	0	1	2	3	1	0	0	0	1	0	5	
3 - 5 :	6	2	2	0	8	3	27	5	28	17	39	5	6	11	16	7	2	189	
1 - 3 :	22	7	8	8	122	132	46	9	7	6	11	3	14	12	20	7	23	457	
LT 1 :	1	0	2	4	22	12	1	0	3	0	1	0	0	0	1	0	3	50	
TOTAL :	29	9	12	12	152	152	75	14	39	25	54	9	20	23	37	15	28	705	
.....																			
PERCENT	4.	1.	2.	2.	22.	22.	11.	2.	6.	4.	8.	1.	3.	3.	5.	2.	4.	100.	

0 = NO OBSERVATIONS

## FREQUENCY TABLE OF WIND SPEED BY DIRECTION

10 METER LEVEL

C-B SHALE OIL PROJECT

METEOROLOGICAL TOWER PERIOD( 8/01/78 TO 8/31/78)

WIND SPEED MAX METERS/SEC	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION								NNW	NW	NNW CALM	TOTAL
									S	SSW	SW	WSW	W	WNW	W	WSW				
GT 11. :	0	0	0	0	0	0	0	0	1	2	1	1	0	0	0	0	0	0	0	5
8. - 11. :	1	0	0	0	0	0	0	1	15	25	12	0	0	0	0	0	1	0	0	55
5. - 8. :	6	2	1	1	0	0	1	10	30	41	18	3	2	4	5	10	0	0	0	134
3. - 5. :	14	7	6	3	6	2	19	22	27	19	23	6	2	11	22	22	3	3	214	
1. - 3. :	9	9	9	22	26	32	18	20	21	23	21	15	17	12	14	8	10	10	286	
LT 1. :	10	0	4	1	4	3	4	1	1	0	2	1	2	1	4	5	6	49		
TOTAL :	40	18	20	27	36	37	42	54	95	110	77	26	23	28	45	46	19	743		
PERCENT	5.	2.	3.	4.	5.	5.	6.	7.	13.	15.	10.	3.	3.	4.	6.	6.	3.	100.		

0 = NO OBSERVATIONS

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C-B SHALE OIL PROJECT

0 = NO OBSERVATIONS



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## FREQUENCY TABLE OF WIND SPEED BY DIRECTION

60 METER LEVEL		METEOROLOGICAL TOWER PERIOD( 8/01/78 TO 8/31/78)											C-B SHALE OIL PROJECT						
		WIND DIRECTION																	
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL
WIND SPEED MAX METERS/SEC		8	6	4	5	4	4	7	8	11	10	11	10	4	8	7	7	4	
GT 11. :		0	0	0	0	0	0	0	0	1	0	5	0	0	0	0	0	0 :	6
3. - 11. :		2	0	0	0	0	0	0	1	14	30	13	2	0	1	0	0	0 :	63
5. - 8. :		8	3	0	1	0	0	5	8	23	48	35	11	0	3	6	11	0 :	162
3. - 5. :		7	11	6	2	4	11	15	15	13	21	23	6	4	12	22	19	4 :	200
1. - 3. :		10	9	3	9	6	28	29	22	13	17	8	8	11	25	15	10	9 :	232
LT 1. :		2	3	3	2	3	7	8	3	6	3	4	5	2	8	6	4	11 :	80
TOTAL :		29	26	12	14	13	46	57	49	75	119	88	32	17	49	49	44	24	743
.....																			
PERCENT		4.	3.	2.	2.	2.	6.	8.	7.	10.	16.	12.	4.	2.	7.	7.	6.	3.	100.

0 = NO OBSERVATIONS

## FREQUENCY TABLE OF WIND SPEED BY DIRECTION

10 METER LEVEL										STATION AB20 PERIOD( 9/01/78 TO 9/30/78)									
WIND SPEED MAX METERS/SEC		WIND DIRECTION																	
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW						
GT	11. :	0	0	0	0	0	0	0	0	0	0	0	0						
8. -	11. :	0	0	0	0	0	0	2	0	0	0	0	0						
5. -	8. :	0	0	0	0	0	0	10	8	4	3	3	2						
3. -	5. :	0	2	2	1	5	15	13	26	10	5	9	11						
1. -	3. :	16	36	15	48	129	42	6	3	5	4	2	13						
LT	1. :	2	4	2	3	18	2	1	0	0	0	1	1						
TOTAL :		18	42	19	52	152	59	32	37	19	12	15	27						
.....																			
PERCENT		3.	7.	3.	9.	26.	10.	5.	6.	3.	2.	3.	5.						

0 = NO OBSERVATIONS

Page 2 of 4

## C-B SHALE OIL PROJECT

10 METER LEVEL

WIND SPEED MAX METERS/SEC	WIND DIRECTION																		TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL	
GT 11. :	0	0	0	0	0	0	0	0	0	0	1	8	1	0	0	0	0	10	
8. - 11. :	0	0	0	0	0	0	0	0	5	6	0	2	3	0	0	0	0	16	
5. - 8. :	0	0	0	0	0	0	0	4	9	32	15	16	6	4	4	2	0	92	
3. - 5. :	13	5	0	0	1	1	2	19	15	19	19	14	6	6	9	13	1	143	
1. - 3. :	16	10	5	15	9	13	18	13	17	32	16	26	15	13	14	18	16	266	
LT 1. :	17	13	5	6	9	7	5	5	5	11	11	4	5	12	9	6	32	162	
TOTAL :	46	28	10	21	19	21	25	41	51	100	62	70	36	35	36	39	49	689	
PERCENT	7.	4.	1.	3.	3.	3.	4.	6.	7.	15.	9.	10.	5.	5.	5.	6.	7.	100.	

0 = NO OBSERVATIONS



## FREQUENCY TABLE OF WIND SPEED BY DIRECTION

C-B SHALE OIL PROJECT

30 METER LEVEL

METEOROLOGICAL TOWER PERIOD( 9/01/78 TO 9/30/78)

## WIND DIRECTION

WIND SPEED MAX METERS/SEC	WIND DIRECTION																TOTAL			
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL		
GT 11. :	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0 :	0 :	4
8. - 11. :	0	0	0	0	0	0	0	0	0	11	8	1	0	0	0	0	0	0 :	0 :	20
5. - 8. :	1	0	0	0	0	0	0	1	6	17	45	8	1	0	4	2	0	0 :	0 :	85
3. - 5. :	12	13	2	1	0	2	3	5	12	22	40	25	8	7	4	13	0	0 :	0 :	169
1. - 3. :	23	9	7	6	10	14	14	24	18	26	13	21	12	15	16	15	14	14 :	14 :	257
LT 1. :	18	9	10	5	9	9	8	11	9	8	10	6	5	8	16	10	21	21 :	21 :	172
TOTAL :	54	31	19	12	19	25	25	41	45	88	116	61	26	30	40	40	35	707		
PERCENT	8.	4.	3.	2.	3.	4.	4.	6.	6.	12.	16.	9.	4.	4.	6.	6.	5.	100.		

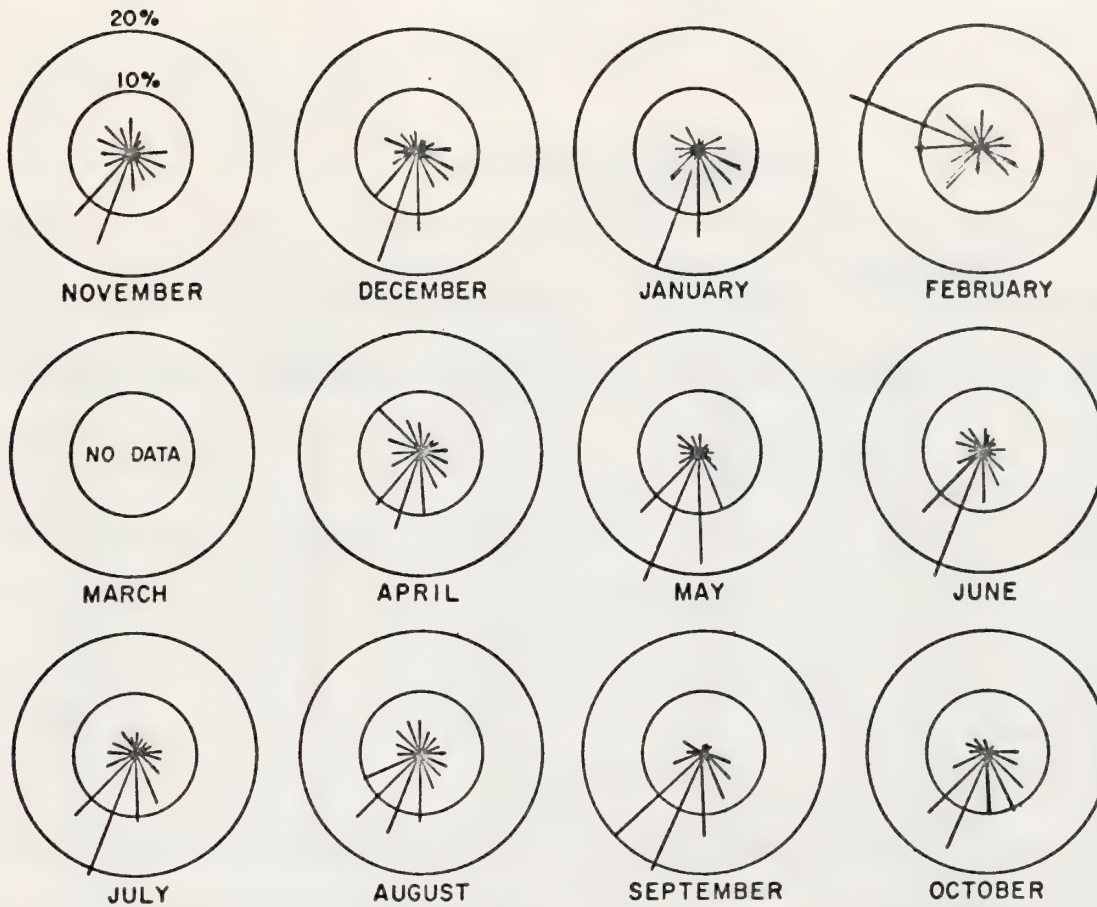
0 = NO OBSERVATIONS

## FREQUENCY TABLE OF WIND SPEED BY DIRECTION

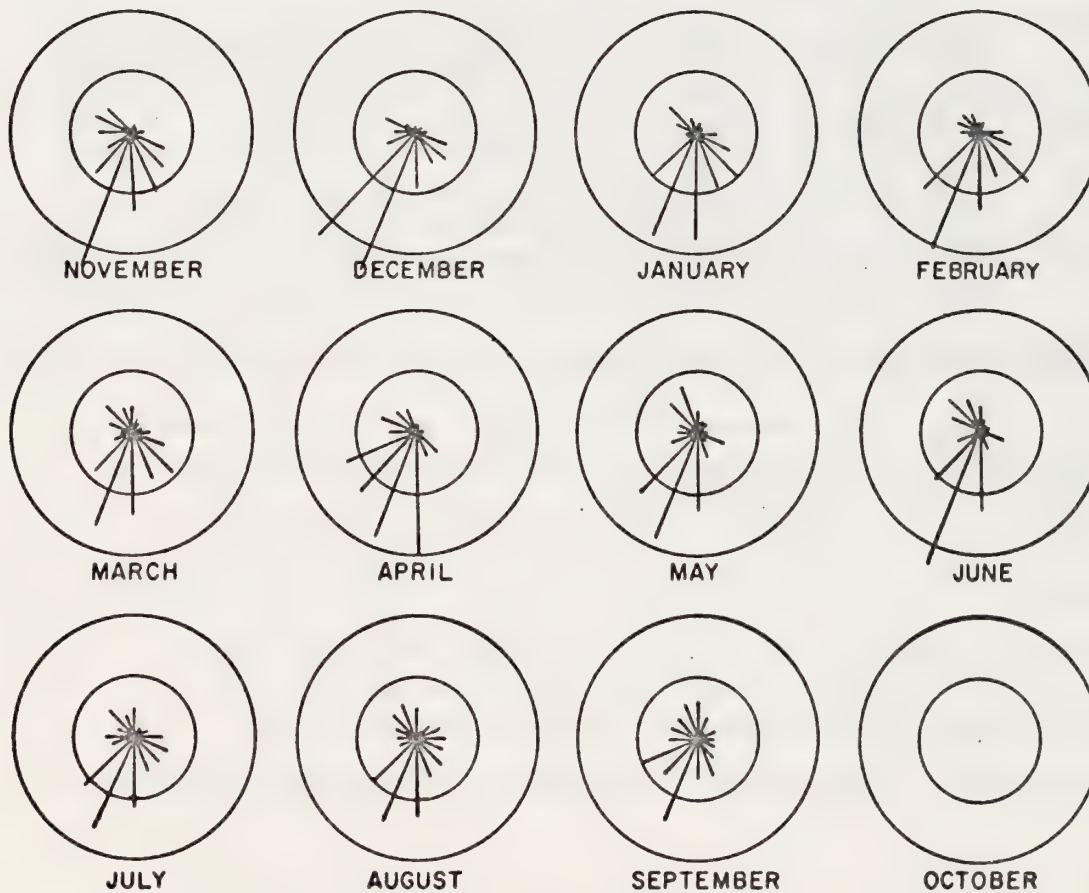
60 METER LEVEL				C-B SHALE OIL PROJECT															
				METEOROLOGICAL TOWER PERIOD( 9/01/78 TO 9/30/78)															
WIND SPEED MAX METERS/SEC		WIND DIRECTION																	
		N	NNE	NE	ENE	E	FSE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL
5		4	3	4	3	3	6	8	15	12	9	6	4	5	7	5	3		
GT 11. :		0	0	0	0	0	0	0	6	2	0	0	0	0	0	0	0	0 :	8
8. - 11. :		0	0	0	0	0	0	1	6	8	1	0	0	0	0	0	0	0 :	16
5. - 8. :		1	0	0	0	0	1	4	12	52	28	2	0	1	6	2	0	0 :	109
3. - 5. :		22	4	1	2	1	6	8	18	30	28	11	8	7	6	13	3	3 :	169
1. - 3. :		11	11	5	3	6	6	18	19	21	12	14	14	21	17	23	9	9 :	227
LT 1. :		8	4	1	5	5	8	11	13	11	15	10	13	11	11	12	13	13 :	170
TOTAL :		42	19	7	10	12	15	36	43	72	128	79	40	33	48	40	50	25	699
.....																			
PERCENT		6.	3.	1.	1.	2.	2.	5.	6.	10.	18.	11.	6.	5.	7.	6.	7.	4.	100.

0 = NO OBSERVATIONS

Figure II B-2



a(76-77)



b(77-78)

STATION 023 10M ELEVATION WIND ROSES





Table II B-41

**SUMMARY OF PRECIPITATION AT TWO STATIONS\***  
(Measured with weighing rain gage)

(1976 - 1977)

STATION	ITEM	MONTH											
		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT
020	1-Hour Max. (Cm) Date Time		.05 12/25/76 13:00	.08 (2)	.13 2/22/77 02:00	.38 3/1/77 12:00	.33 4/27/77 21:00	.36 5/15/77 19:00	.28 6/12/77 12:00	1.12 7/19/77 04:00	.56 8/25/77 02:00	4.32 9/3/77 12:00	.76 10/6/77 19:00
023	1-Hour Max. (Cm) Date Time (MST)		.08 12/10/77 02:00	.13 (3)	.18 2/26/77 19:00	.25 (4)	.25 4/11/77 10:00	.41 5/15/77 16:00	.05 6/24/77 17:00	1.09 7/19/77 15:00	.97 8/5/77 19:00	.56 9/3/77 01:00	.76 10/6/77 19:00
020	24-Hour Max. (Cm) Date		.10 12/19/77	.56 1/22/77	.43 2/22/77	.97 3/1/77	.69 4/12/77	.76 5/14/77	.28 6/12/77	1.75 7/19/77	1.85 8/26/77	5.89 9/3/77	1.37 10/6/77
023	24-Hour Max. (Cm) Date		.10 (1)	.36 1/5/77	.36 2/26/77	.66 3/1/77	.74 4/15/77	.71 5/14/77	.05 (5)	1.40 7/19/77	1.12 8/5/77	2.44 9/11/77	1.37 10/6/77
020	Total (Cm)		.74	2.31	1.19	4.24	3.15	2.39	.38	3.91	5.18	9.27	2.57
023	Total (Cm)		.99	2.03	1.35	4.01	3.18	2.79	.41	4.70	5.66	3.73	2.24

(1977 - 1978)

STATION	ITEM	MONTH											
		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT
020	1-Hour Max. (Cm) Date Time (MST)	.53 11/19/77 16:00	.41 12/16/77 02:00	.13 (6)	.10 (8)	.46 3/24/78 08:00	.18 4/5/78 05:00	.69 5/21/78 14:00	.76 6/5/78 14:00	.30 7/29/78 13:00	.25 8/1/78 21:00	.48 9/18/78 05:00	
023	1-Hour Max. (Cm) Date Time	.33 11/19/77 16:00	.28 12/16/77 01:00	.10 (7)	.30 2/27/78 22:00	.51 3/24/78 09:00	.23 4/2/78 16:00	1.35 5/21/78 14:00	.20 6/5/78 15:00	1.17 7/29/78 14:00	.33 8/1/78 06:00	.36 9/18/78 06:00	
020	24-Hour Max. (Cm) Date	2.77 11/19/77	1.60 12/16/77	.56 1/15/78	.53 2/20/78	1.45 3/24/78	.38 4/5/78	1.22 5/17/78	1.09 6/5/78	.43 7/29/78	.46 8/1/78	.97 9/18/78	
023	24-Hour Max. (Cm) Date	1.85 11/19/77	.84 12/16/77	.43 1/15/78	.66 2/20/78	1.70 3/14/78	.71 4/1/78	1.65 5/21/78	.38 6/5/78	1.22 7/29/78	.48 8/1/78	.91 9/18/78	
020	Total (Cm)	4.37	3.43	3.02	2.11	8.13	1.70	3.99	2.57	2.18	2.36	1.83	
023	Total (Cm)	3.66	2.16	1.65	2.64	8.36	2.29	3.94	1.30	1.98	.48	1.40	

\* Monitoring of precipitation with weighing rain gage was not initiated until December 13, 1976 at Station 020 and December 6, 1976 at Station 023.

- (1) The 24-hour max for December at Station 023 occurred 4 times: 12-9-77, 12-10-77, 12-19-77, and 12-31-77.
- (2) The 1-hour max for January at Station 020 occurred 6 times: 1-3-77 @ 19:00, 1-3-77 @ 20:00, 1-4-77 @ 18:00, 1-16-77 @ 14:00, 1-22-77 @ 24:00, and 1-23-77 @ 01:00.
- (3) The 1-hour max for January at Station 023 occurred 3 times: 1-3-77 @ 18:00, 1-3-77 @ 20:00, and 1-16-77 @ 16:00.
- (4) The 1-hour max for March at Station 023 occurred 4 times: 3-1-77 @ 23:00, 3-1-77 @ 24:00, 3-2-77 @ 01:00, and 3-26-77 @ 03:00.
- (5) The 24-hour max for June at Station 023 occurred 4 times: 6-8-77, 6-10-77, 6-24-77, and 6-27-77.
- (6) The 1-hour max. for January at Station 020 occurred 2 times: 1-15-78 @ 19:00, and @ 22:00.
- (7) The 1-hour max. for January at Station 023 occurred 5 times: 1-10-78 @ 18:00; 1-15-78 @ 20:00, @21:00 and @ 24:00; 1-16-78 @ 01:00.
- (8) The 1-hour max. for February at Station 020 occurred 5 times; 2-12-78 @ 16:00; 2-18-78 @ 22:00; 2-20-78 @ 04:00; 2-27-78 @ 21:00 and @ 22:00.

Table II B-42

SOLAR RADIATION  
STATION 023

MONTH	LANGLEYS * (UNMODIFIED)	AVERAGE DAYLIGHT HOURS/DAY	DAYLIGHT HOURS IN MONTH	UPTIME DAYLIGHT HOURS IN MONTH	AVERAGE LANGLEYS PER DAY (MODIFIED)	HIGHEST DAILY TOTAL/DATE	LOWEST DAILY TOTAL/DATE
11/76	6725	10	300	299	224.9	307/1	75/13
12/76	5685	10	310	310	183.4	242/1	73/5
1/77	6043	10	310	309	195.6	376/25	54/5
2/77	7850	11	308	308	280.4	409/27	92/22
3/77	10737	12	372	360	357.9	523/27	110/17
4/77	12870	13	390	390	429.0	598/10&24	90/19
5/77	16228	14	434	431	527.1	717/18	209/14
6/77	18590	15	450	450	619.7	744/19	381/7
7/77	14526	15	465	420	518.8	731/10	269/4
8/77	13970	14	434	424	461.3	674/1	172/17
9/77	11904	13	390	375	412.7	568/2	121/28
10/77	9676	12	372	366	317.3	667/2	89/31
11/77	5569	10	300	279	199.6	323/1	36/19
12/77	1328	10	300	81	164.0	229/5	75/3
1/78	1147	10	310	98	117.0	249/13	67/18
2/78	4508	11	308	168	267.6	404/18	90/3
3/78	954	12	372	22	432.8	101/30	67/31
4/78	Solar Radiation held pending calibration of instrument.						
5/78	7587	15	446	183	414.3	714/12	5/21
6/78	Solar Radiation out for Repair						
7/78	1835	14	434	55	333.6	646/30	366/29
8/78	16327	14	434	431	378.6	663/3	234/14
9/78	12107	13	390	376	322.0	483/22	126/18

\*The above values have not been modified to include radiation received during downtime (instrument calibration, computer downtime, etc.).

Table II B-43  
METEOROLOGICAL SUMMARY: TEMPERATURE AND RELATIVE HUMIDITY  
STATION 023  
(10 Meter Height)\*

Item	By Month											
	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept.	Oct
Temperature, Hourly Maximum (°C)	15	8	7	12	12	19	22 (1)	28 (1)	28 (1)	29	34	22
Temperature, Hourly Minimum (°C)	-19	-13	-20	-13	-16	-11	-2 (1)	7 (1)	11 (1)	3	-4	-12
Temperature, Hourly Average (°C)	1	-3	-5	-2	-2	6	9 (1)	20 (1)	21 (1)	19	15	5
Relative Humidity, Hourly Maximum (%)	97	96 (1)	(2)	(2)	74 (1)	100	(2)	(2)	(2)	(2)	99 (1)	(2)
Relative Humidity, Hourly Minimum (%)	32	30 (1)	(2)	(2)	41 (1)	37	(2)	(2)	(2)	(2)	15 (1)	(2)
Relative Humidity, Hourly Average (%)	56	58 (1)	(2)	(2)	56 (1)	67	(2)	(2)	(2)	(2)	37 (1)	(2)

Item	By Month											
	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept.	Oct
Temperature, Hourly Maximum (°C)	18	13	13	6	15	18	24	28	31	29	28	
Temperature, Hourly Minimum (°C)	-17	-8	-2	-15	-11	-5	-4	2	7	2	-3	
Temperature, Hourly Average (°C)	3	4	7	-3	2	6	9	17	21	18	15	
Relative Humidity, Hourly Maximum (%)	(2)	99	97	96	96	95	94	96	94	94	97	
Relative Humidity, Hourly Minimum (%)	(2)	10	32	25	20	14	13	12	9	9	8	
Relative Humidity, Hourly Average (%)	(2)	65	74	71	66	53	49	42	38	38	45	

- (1) Partial Data Only  
(2) Missing Data

\* Relative humidity data starting in September, 1977, collected at a 1 meter height.



LOW ALTITUDE  
METEOROLOGY



## II B-2 LOW ALTITUDE METEOROLOGY

Low altitude meteorology tower data are obtained at 10m, 30m, and 60m for wind direction and speed, relative humidity, and temperature. Barometric pressure and daytime solar radiation are obtained at ground level. Temperature differences are obtained between the 10m and 60m levels.

Basic low altitude meteorological data through September 1978 are contained in Refs. 1-12 at the end of this section.

<u>Table/Figure No.</u>	<u>Description</u>	<u>Page No.</u>
	<u>Wind Rose Diagram</u>	
Figure II B-3	This figure presents the quarterly and annual wind roses for the 30m level of the meteorological tower for the year September 1977 - August 1978.	II B-144



QUARTERLY WIND ROSE - 30M LEVEL  
SEPT '77 - NOV '77

TOTAL % OF CALMS DISTRIBUTED (0.00%)  
TOTAL NO. 1 - HR SAMPLES (2075)

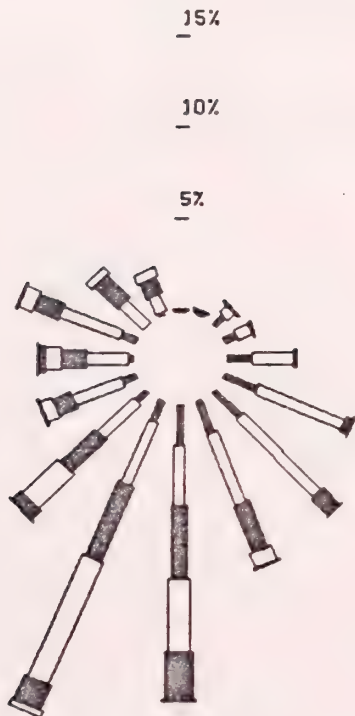
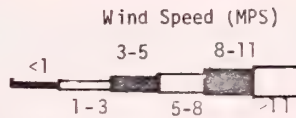
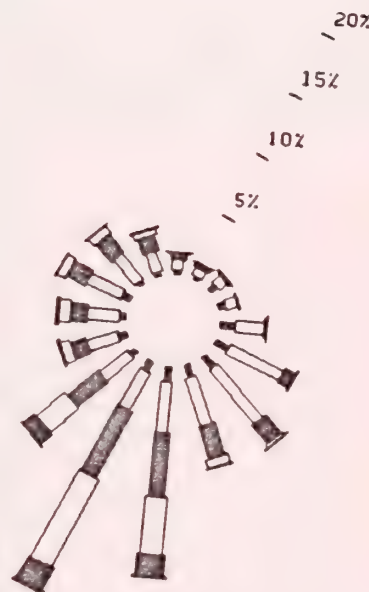


Figure II B-3

NORTH

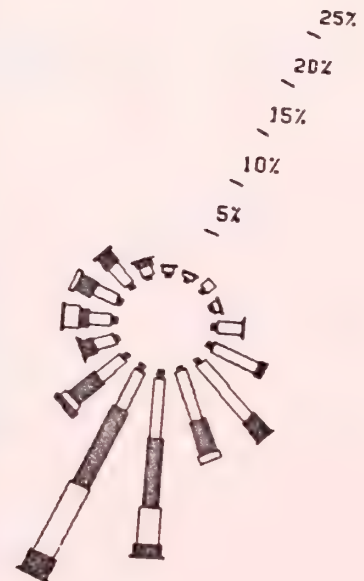


ANNUAL WIND ROSE - 30M LEVEL  
SEPT '77 - AUG '78  
TOTAL % OF CALMS DISTRIBUTED (2.24%)  
TOTAL NO. 1-HR SAMPLES (7335)



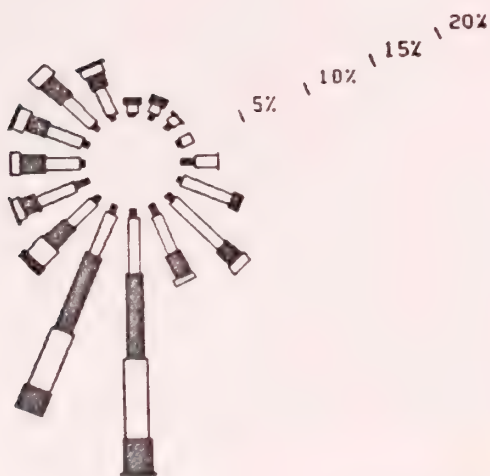
QUARTERLY WIND ROSE - 30M LEVEL  
DEC '77 - FEB '78

TOTAL % OF CALMS DISTRIBUTED (3.73%)  
TOTAL NO. 1 - HR SAMPLES (1770)



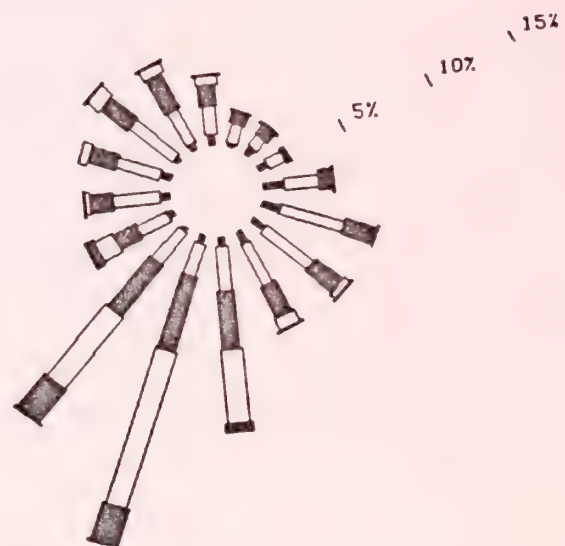
QUARTERLY WIND ROSE - 30M LEVEL  
MAR '78 - APR '78

TOTAL % OF CALMS DISTRIBUTED (4.20%)  
TOTAL NO. 1 - HR SAMPLES (1333)



QUARTERLY WIND ROSE - 30M LEVEL  
JUNE '78 - AUG '78

TOTAL % CALMS DISTRIBUTED (1.95%)  
TOTAL NO. 1 - HR SAMPLES (2158)



METEOROLOGICAL TOWER 30M ELEVATION  
QUARTERLY AND ANNUAL WIND ROSES  
1977 - 1978







### II B-3 UPPER AIR STUDIES

Upper air studies have been conducted in this time period beginning in November, 1977 for both the acoustic radar (Sta 020) and pibal (Sta 024). The acoustic radar yields mixing height (M) and inversion top height (I) as shown on Figure II B-4. Pibal studies yield vertical (height) profiles of wind speed, direction and temperature. Results for both are reported in the references at the end of section II B. The following additional information is provided here:

<u>Table/Figure No.</u>	<u>Description</u>	<u>Page No.</u>
Table II B-44	Average Hourly Inversion Height by Month for Acoustic Radar	II B-146

Table II B-44  
AVERAGE HOURLY INVERSION (2) HEIGHT BY MONTH  
(Acoustic Radar @ Station 020)

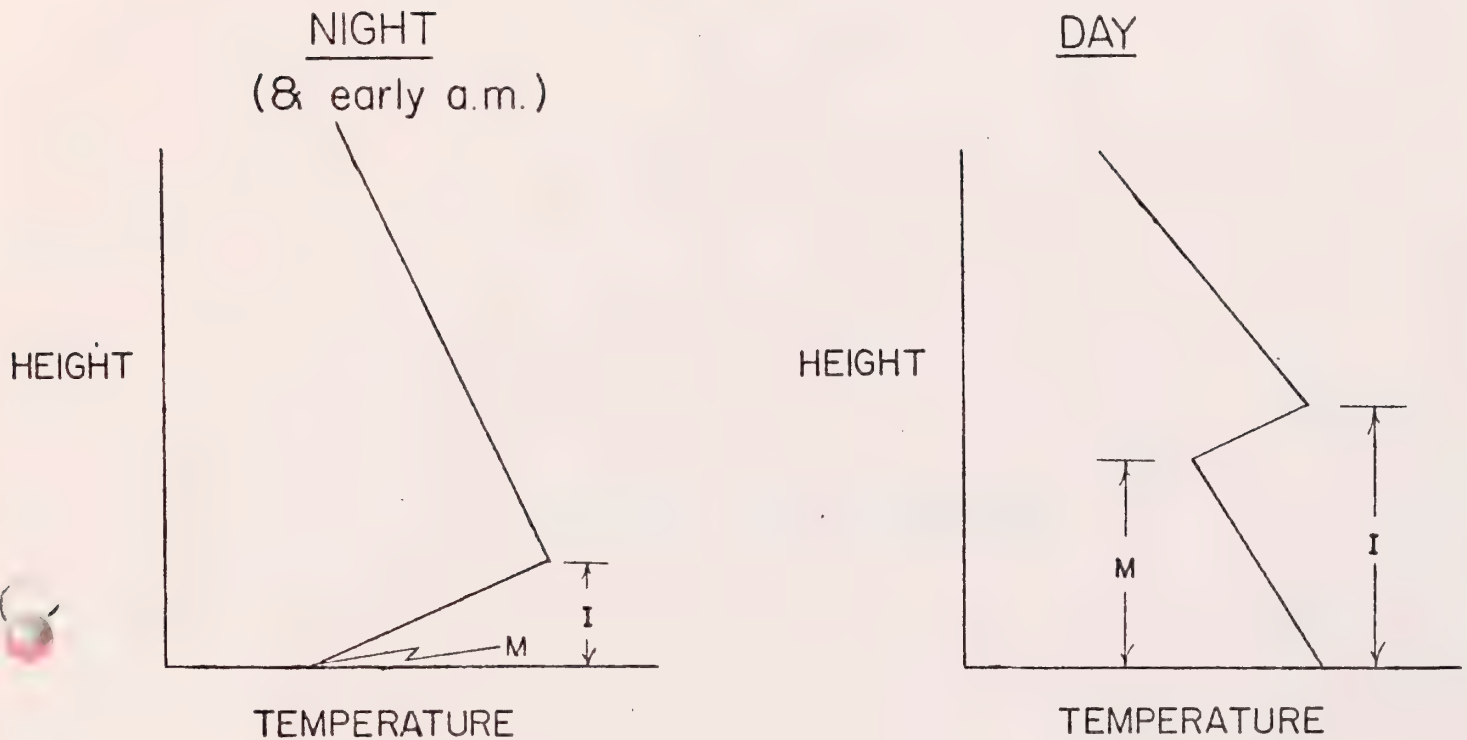
ITEM	MONTH	Beginning Clock Hour (MST)																								Average
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
I	(1) November 1977	104	109	128	127	121	120	156	134	112	100	80							70	119	109	105	114	114	120	114
I	December 1977	181	197	198	186	186	181	191	205	195	179	131							158	188	188	188	202	208	197	187
I	January 1978	141	141	147	148	158	154	159	165	155	139	113							120	138	151	153	162	168	165	149
I	February 1978	151	163	154	154	150	151	158	152	142	119	105	82	60				65	72	113	159	172	162	171	162	140
I	March 1978	201	220	228	231	235	234	227	192	144	98	190	140			130	200	210	139	171	199	226	224	201		200
I	April 1978	198	229	231	214	204	211	198	169	170	140				150	230	180	250	99	112	156	192	184	195		180
I	May 1978	165	176	194	206	213	182	144	124	193	280	260							100	97	95	105	136	150	168	160
I	June 1978	315	318	305	289	301	292	234	225											100	204	267	298	298		248
I	July 1978	448	463	470	488	504	512	459	316	198										144	253	338	398	392		397
I	August 1978	356	374	376	393	386	402	370	265	211										168	261	329	355	347		328
I	September 1978	322	329	357	385	389	390	378	334	215										103	214	311	347	335	335	319

I- Inversion (Top) Height (m.)

(1) Partial Data

(2) In midday the inversion breaks and rapidly goes off scale at the max. instrument height of 500 m. Numbers are shown only when inversion expectation exceeds 50%.

## FIG IIB-4 DEFINITIONS OF MIXING HEIGHT AND INVERSION HEIGHT



M = Mixing Height  
I = Inversion (TOP) Height

Note: If  $h(\text{stack}) > I$  (either case) then  
 $M = \infty$



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## II B-4 VISIBILITY

PROGRESS REPORT - SPRING, 1978  
DOCUMENTATION OF VISIBILITY  
IN THE PICEANCE CREEK BASIN  
FOR RIO BLANCO OIL SHALE PROJECT  
C-b SHALE OIL VENTURE

ANCHORAGE  
ATLANTA  
BALTIMORE  
BOCA RATON  
BOSTON  
CHICAGO  
CINCINNATI  
CRAWFORD  
DENVER  
FAIRBANKS  
HONOLULU  
HOUSTON  
KINGSTON, KY  
LOS ANGELES  
NEW ORLEANS  
NEWPORT BEACH  
NEW YORK  
PHOENIX  
PORTLAND  
SALT LAKE CITY  
SAN FRANCISCO  
SANTA BARBARA  
SEATTLE  
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TWX: 910-951-0637

July 18, 1978

Occidental Oil Shale, Inc.  
2372 G Road  
Box 2687  
Grand Junction, Colorado 81501

Attention: Dr. George E. Fosdick

Gentlemen:


Progress Report - Spring, 1978  
Documentation of Visibility  
in the Piceance Creek Basin  
for Rio Blanco Oil Shale Project  
C-b Shale Oil Venture


We are pleased to submit four (4) copies of the Spring Quarterly Report on the "Documentation of Visibility in the Piceance Creek Basin." This report is the first of two reports which document the visibility in the Piceance Creek Basin area during 1978. The results presented in this report were obtained from approximately 280 visual range measurements obtained during April and May, 1978.

If there are any questions, please contact us.

Sincerely,

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PROGRESS REPORT - SPRING, 1978  
DOCUMENTATION OF VISIBILITY  
IN THE PICEANCE CREEK BASIN  
FOR RIO BLANCO OIL SHALE PROJECT  
C-b SHALE OIL VENTURE

DAMES & MOORE

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## ABSTRACT

Visual range measurements were made by photographic photometry in the Piceance Creek Basin area during the Spring of 1978 by Dames & Moore for Rio Blanco Oil Shale Project and C-b Shale Oil Venture. This program is one of many environmental studies being conducted to satisfy the requirements of the Federal Oil Shale Lease Environmental Stipulations.

Visual ranges obtained during this period were generally high; ninety-five percent of the measurements were greater than 43 miles, fifty percent were greater than 71 miles. Daily mean visual ranges exhibited large variations during the period, ranging from 50 to 102 miles; variations in mean hourly visual ranges were small, however, and were less than 15 miles in each view. The generalized visibility (mean visual range) was found to be 79 miles for the Spring season.



## INTRODUCTION

Documentation of visibility in the Piceance Creek Basin area is a cooperative study conducted by Dames & Moore for the Rio Blanco Oil Shale Project and C-b Shale Oil Venture. This study is one of many environmental programs being conducted to satisfy the requirements of the Federal Oil Shale Lease Environmental Stipulations and represents the second year of data collection in the Piceance Creek Basin area.

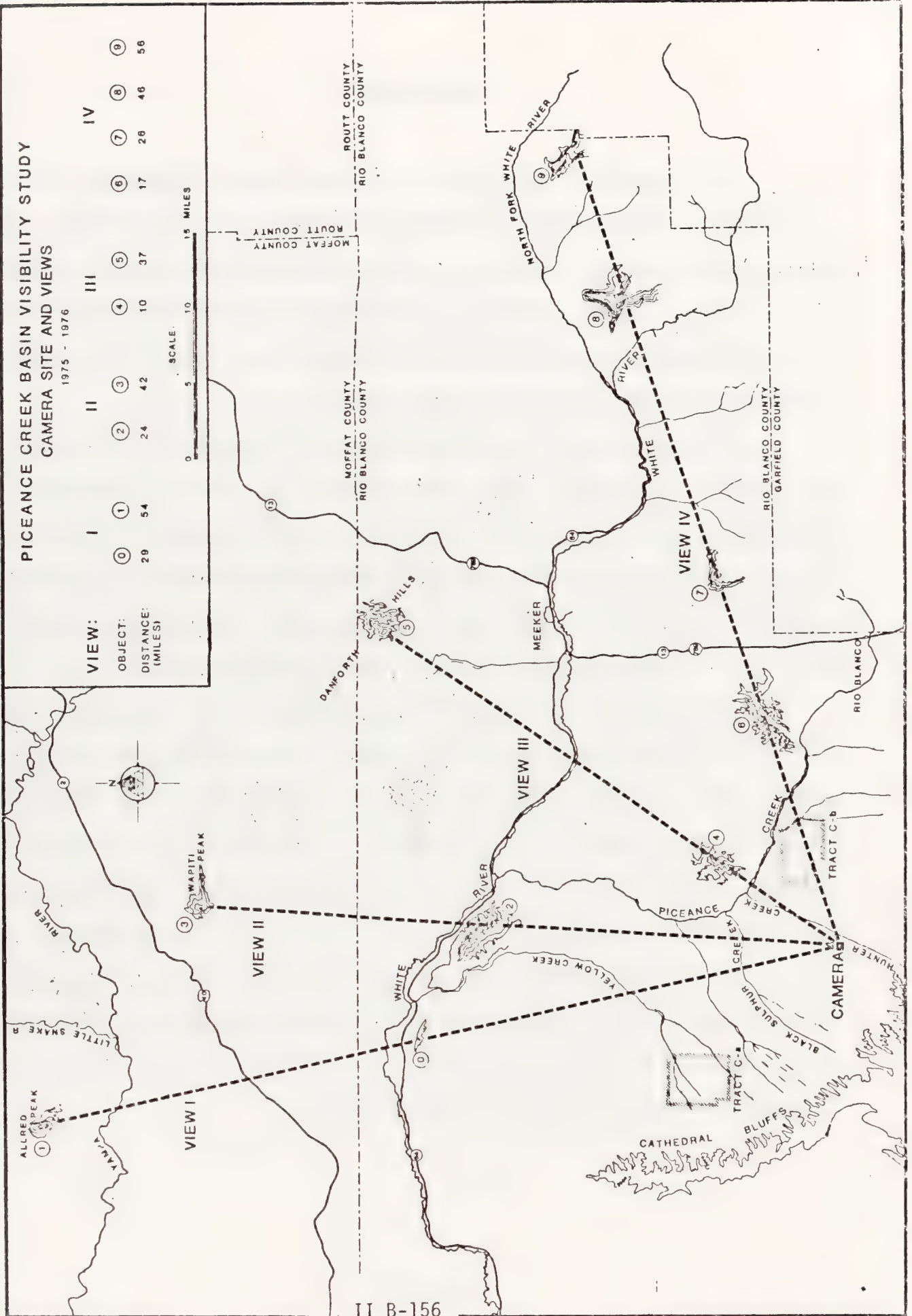
The objectives of this program are to document the visibility in the area of the Piceance Creek Basin and identify trends or variations in visibility which may be evident during the monitoring program. The results of this program will provide visibility data against which past and future data may be compared and with which concurrent meteorological and air quality data may be incorporated for further evaluation and consideration.

The methods employed in the documentation of visibility during this study incorporate techniques identical to those utilized during the initial study conducted during 1975-76 and will therefore not be discussed in detail in this report; only the frequency of monitoring has been modified from the original study. Instead of data collection every sixth-day over a one-year period, data are collected every sixth day during two seasons: the Spring, represented by April and May, and the Fall, represented by October and November; all other aspects, including the site and views used (illustrated in Plate 1), the field procedures, data processing and the method of data presentation remain true to the original program.

# PICEANCE CREEK BASIN VISIBILITY STUDY CAMERA SITE AND VIEWS 1975 - 1976

VIEW:	I			II			III			IV		
OBJECT:	0	1	2	3	4	5	6	7	8	9		
DISTANCE: (MILES)	29	54	24	42	10	37	17	28	46	56		

SCALE: 0 5 10 15 MILES



Visibility measurements presented in this report were obtained during the months of April and May, 1978 and represent the Spring, 1978 monitoring period. Approximately 280 measurements were obtained and used in the statistical analysis of visual range during the Spring Quarter.

#### METHOD OF DATA PRESENTATION

During the Spring 1978 monitoring period, visual range measurements were made during ten scheduled days of photography over a two month period. Of a possible 280 visual range measurements, 272 were obtained for a 97 percent data recovery; no days occurred in which no measurements were obtained for the views.

Measurements of visual range during the Spring Quarter were occasionally hampered by passing rain or snow showers which restricted visibility and made photography of the views difficult. Accumulations of snow on some objects being photographed required adjustments to be made in their albedo. The resulting albedo for these objects was estimated using the original albedo of the object modified by the relative contribution of the snow. The albedo values used for the original objects' surfaces and for the additional snow cover were based on the spectral reflectance of snow and various soil types listed in the Handbook of Geophysics and Space Environments (Valley, Sheal L., 1975). The resultant albedoes for the nine objects ranged from 0.15 to 0.85; the albedoes of those objects used to determine the visual range for each view, however, ranged from 0.15 to 0.50.



Results of the visual range measurements and statistical analysis are presented in this report on an expanding time basis as explained below:

A. Daily Basis - discussion of visual ranges obtained per day

- 1) Mean - for composite of views
- 2) Trends: discussion of variations in mean visual range - for each view.

B. Monthly Basis - discussion of visual ranges obtained per month

- 1) Mean - for composite of views
- 2) Maximum and minimum - for composite of views
- 3) Distribution - for composite of views

C. Seasonal Basis - discussion of visual ranges obtained during the season

- 1) Mean - for each view  
- for composite of views
- 2) Maximum and minimum - for each view  
- for composite of views
- 3) Five percentile: 95 percent of observations exceeded this value - for each view  
- for composite of views
- 4) Standard Deviation: measure of the dispersion of a frequency distribution - for each view  
- for composite of views
- 5) Distribution - for each view  
- for composite of views
- 6) Trends: discussion of variations in mean hourly visual range - for each view  
- for composite of views

## RESULTS AND CONCLUSIONS

### EVALUATION OF VISUAL RANGE ON A DAILY BASIS

Daily mean visual ranges during the Spring Quarter exhibited large fluctuations; variations in the mean visual range of consecutive days of photography ranged from less than two miles to more than forty miles. The largest of these occurred between May 6 and May 12, 1978 when the mean visual range increased from 50 to 94 miles; the 6th of May was characterized by scattered snow showers; May 12th by clear skies.

The daily mean visual ranges obtained every sixth day during the Spring Quarter are listed in Table 1. Mean visual ranges generally occurred in the mid-sixties to the lower nineties although daily mean visual ranges near 50 miles were recorded; the hourly visual ranges used to compute the daily mean are included in Appendix A-1.

Daily means visual ranges during this period were slightly higher than those recorded during the Spring Quarter of 1976, although extreme values were similar. During 1976, the maximum and minimum daily mean visual ranges recorded were 101 and 45 miles, respectively; during 1978 the respective values were 102 and 50 miles.

Fluctuations in the mean visual ranges, although large, were generally similar among the views; an increase or decrease in the mean visual range for an individual view was generally matched by a similar response in the remaining views. These fluctuations, shown in Figure 1, illustrate the continuity in the response of the views to changing visibility restrictions.

TABLE 1

DAILY MEAN VISUAL RANGE (MILES)  
PICEANCE CREEK BASIN, COLORADO  
SPRING, 1978

<u>DATE</u>	<u>MEAN VISUAL RANGE</u>
April 6, 1978	102
12	94
18	81
24	83
30	54
May 6, 1978	50
12	94
18	88
24	66
30	69



View I  
View II  
View III  
View IV

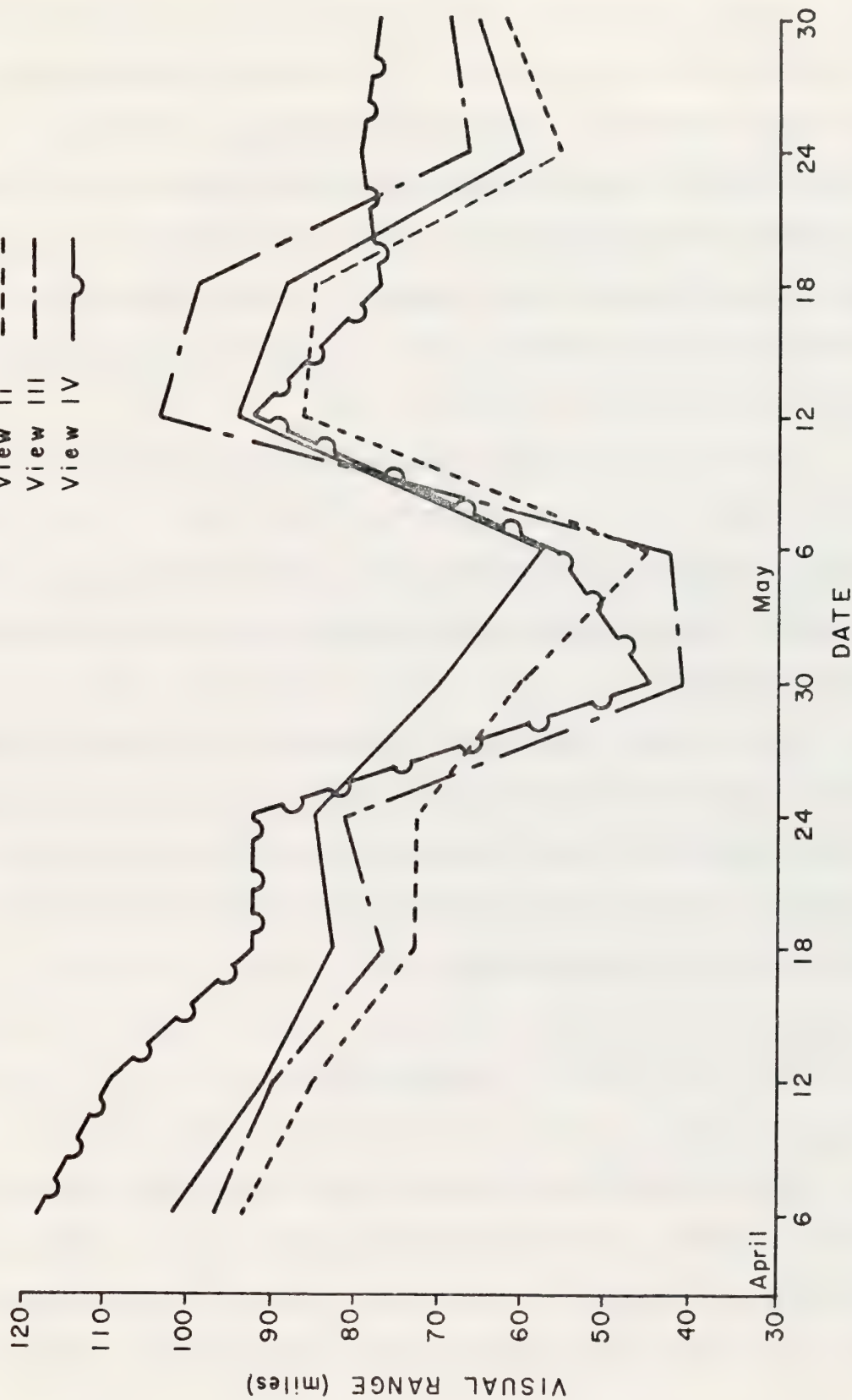


FIGURE I  
VARIATION IN DAILY MEAN VISUAL RANGE FOR EACH VIEW  
PICEANCE CREEK BASIN, COLORADO  
SPRING, 1978

Days of low mean visual ranges, such as April 30 and May 6, were characterized by passing rain or snow showers which restricted visibility in some occurrences. No instance of severe restrictions to visibility which interrupted the photographic measurements was reported in the Site Log by the photographer; occurrences of haze which affected the clarity of the objects being photographed were reported, however. Haze in Views I and II, for example, was often reported in the Site Log during the morning hours and, on occasion, was reported as lasting all day.

On May 24, 1978, for example, the photographer recorded in the Site Log heavy haze in the northwest; Views I and II were reported to have haze throughout most of the day. With the exception of the haze, the day was sunny and clear, with scattered clouds; the daily mean visual range was 66 miles.

Days of high mean visual ranges, such as April 6 and 12 were reported in the Site Log as having little or no haze. The mean visual ranges for these days were 102 and 94 miles, respectively. A copy of the Site Log is included as Appendix A-2 and has been typed for presentation due to poor reproduction of the original sheets.

#### EVALUATION OF VISUAL RANGE ON A MONTHLY BASIS

Monthly mean visual ranges were considerably higher in April, 1978 than in April, 1976, although the May values for both years were within 4 miles. The mean visual range for April, 1978 was 83 miles, compared with 67 miles during 1976. The mean visual range for May, 1976 was 70 miles;

for May, 1978 it was 74 miles. The general characteristics for April and May, 1978 are listed in Table 2.

The monthly composite distribution of visual range, shown in Figure 2, illustrates the high frequency of high values during April. Visual ranges during April and May, however, exhibited a similarity in the range of values obtained. The minimums were within 4 miles; the maximums were within 10 miles.

#### EVALUATION OF VISUAL RANGE ON A SEASONAL BASIS

During the Spring Quarter, visual ranges were generally high; ninety-five percent of the visual range measurements were greater than 43 miles; 50 percent were greater than 71 miles. This compares with 39 and 67 miles during 1976, respectively. Pertinent statistics for each view and all views combined during the Spring Quarter are listed in Table 3.

Maximum visual ranges obtained during this period varied by 30 miles. The maximum visual range in View IV was 142 miles, compared with 138 miles in 1976 and 112 miles in View II, compared with 113 miles in 1976. Minimum visual ranges varied considerably among the views; minimum visual ranges from 17 to 51 miles were recorded.

The mean visual ranges of the four views during the Spring Quarter were comparable; the mean visual range in View II was the lowest. The mean visual ranges for Views I, III, and IV were 81, 77, and 84 miles, respectively; the mean visual range in View II was 73 miles. The distribution of visual range in the four views is shown in Figure 3.



TABLE 2

VISUAL RANGE (MILES) STATISTICS  
FOR ALL VIEWS COMBINED  
FOR EACH MONTH OF MONITORING  
PICEANCE CREEK BASIN, COLORADO  
SPRING, 1978

<u>Month</u>	<u>Mean</u>	<u>Maximum</u>	<u>Minimum</u>	<u>Standard Deviation</u>
April	83	142	21	21.1
May	74	132	17	20.5

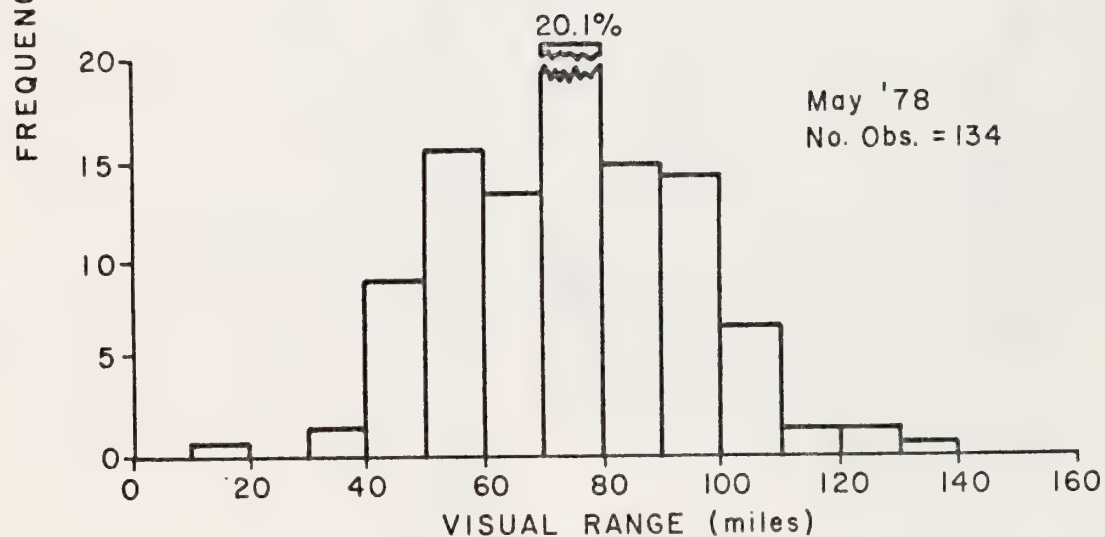
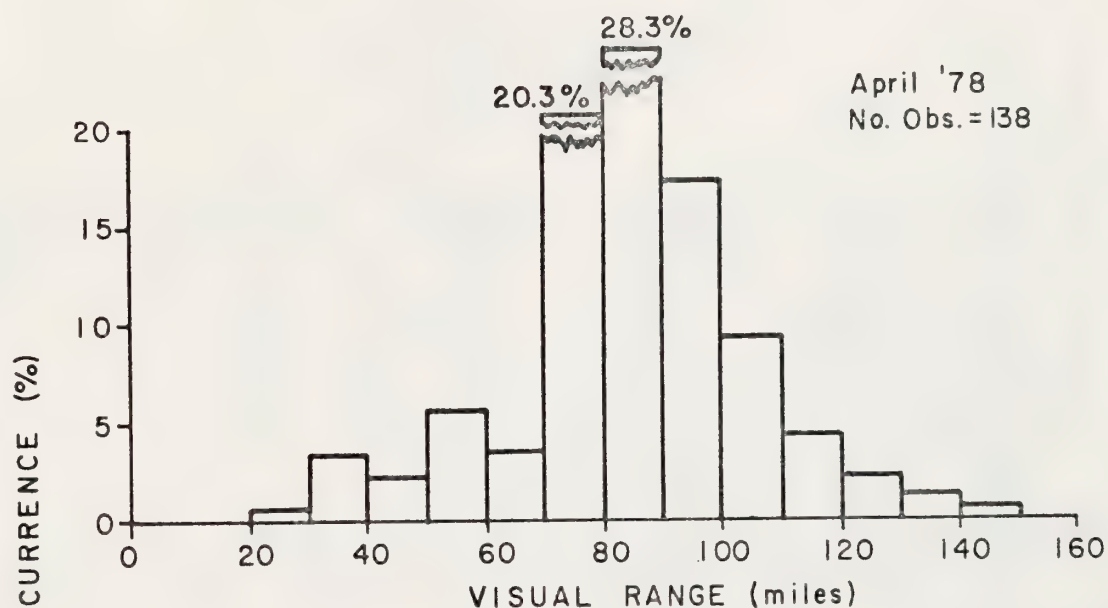


FIGURE 2  
MONTHLY COMPOSITE DISTRIBUTION OF VISUAL RANGE  
PICEANCE CREEK BASIN, COLORADO  
SPRING, 1978

TABLE 3

VISUAL RANGE SUMMARY (MILES)  
PICEANCE CREEK BASIN, COLORADO  
SPRING, 1978

<u>View</u>	<u>Mean</u>	<u>Maximum</u>	<u>Minimum</u>	<u>5* Percentile</u>	<u>Standard Deviation</u>
I	81	126	51	53	16.5
II	73	112	32	42	17.1
III	77	132	17	35	23.7
IV	84	142	35	45	24.8
Composite	79	142	17	43	21.2

\*5 percentile is that value above which fall 95% of the measurements



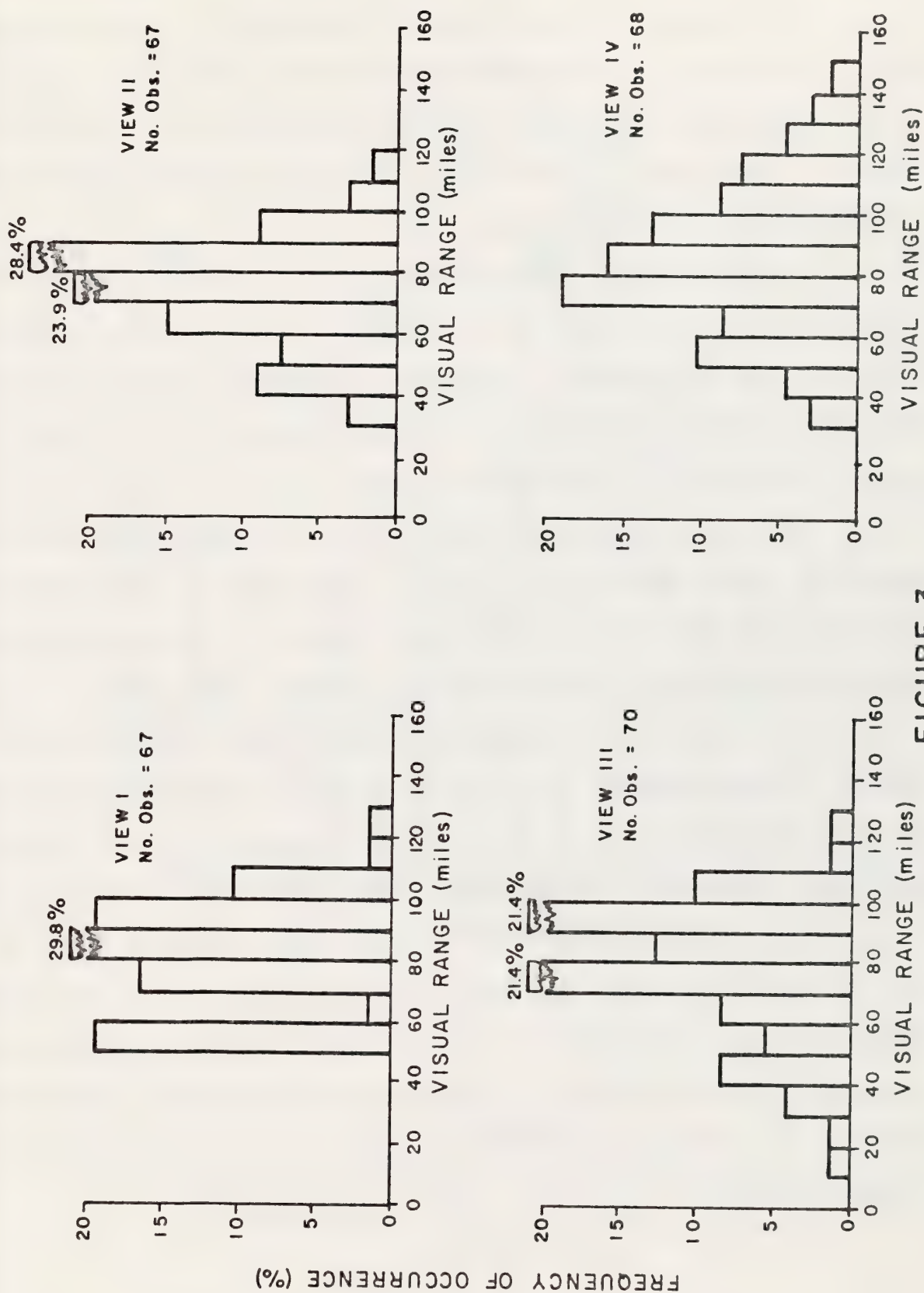


FIGURE 3

DISTRIBUTION OF VISUAL RANGE IN EACH VIEW  
PICEANCE CREEK BASIN, COLORADO  
SPRING, 1978

For purposes of describing the general state of visibility independent of direction, a composite distribution of all visual range measurements during the Spring Quarter was made. This distribution is illustrated in Figure 4. Visual ranges obtained during this period occurred most frequently between 80 and 90 miles.

To distinguish that mean value for all views during a season from the mean visual range for an individual view, the term generalized visibility has been chosen to represent the composite mean visual range. The term generalized visibility is the areal visibility and the term visual range is reserved for a single path or view.

The generalized visibility in the Piceance Creek Basin area during the Spring Quarter was 79 miles. This value can be considered in comparison with the results of the study conducted in 1976; the generalized visibility during this study was 69 miles. (Dames & Moore, 1976).

To describe hourly trends, mean hourly visual ranges for each view and for all views combined are presented in Figure 5 for each hour of photography. The separation of Views I and II from Views III and IV in Figure 5 have been performed only to facilitate comparison of the individual trends.

Hourly fluctuations in the mean visual range of Views I, II and III exhibit a general similarity, with the exception of a early morning increase in mean visual range in View II. View IV exhibits a larger morning increase in visual range than the remaining views, although it does have the same general decline in visual range at 1300 MST and the following increase in the afternoon.

ALL VIEWS  
No. Obs. = 272  
Gen. Vis. = 79 miles  
Std. Dev. = 21.2 miles

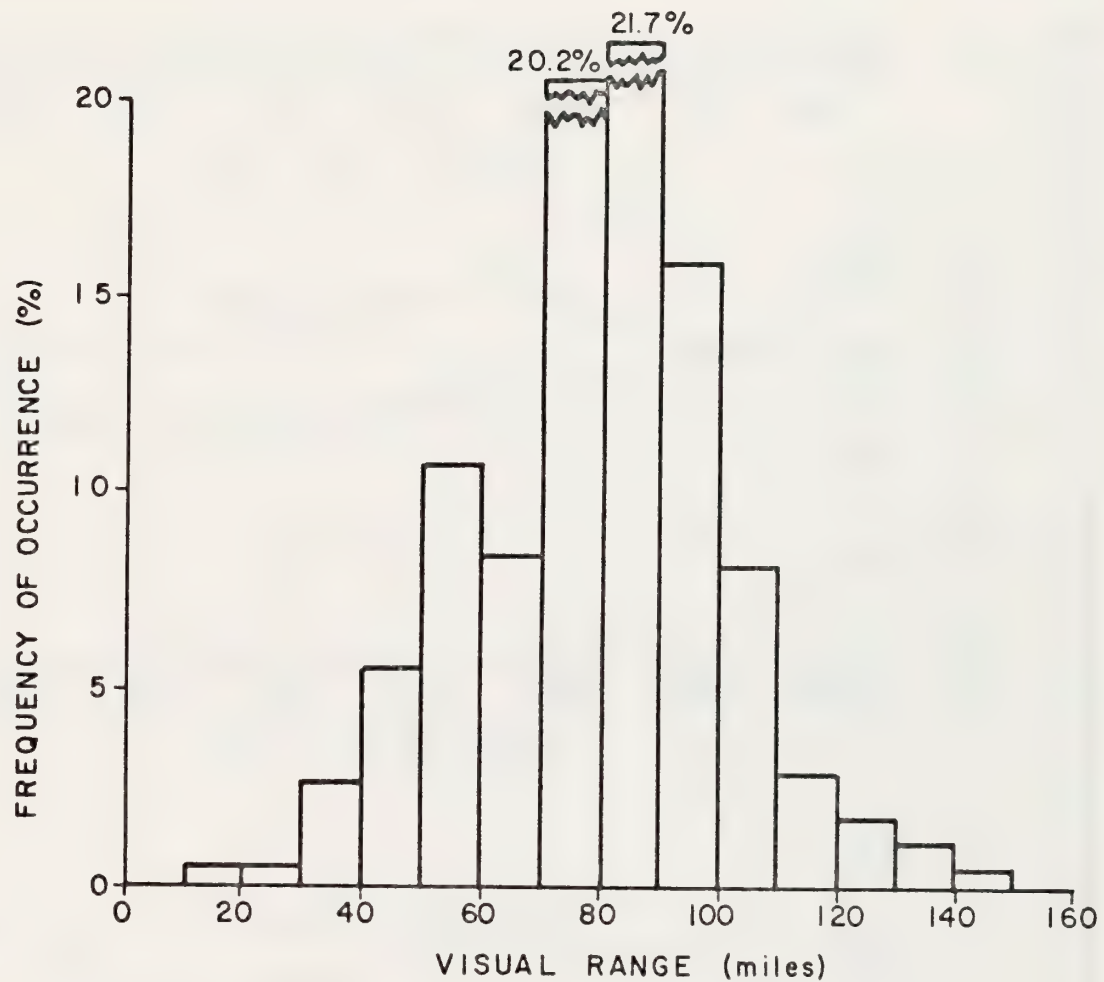


FIGURE 4  
COMPOSITE VISUAL RANGE DISTRIBUTION  
PICEANCE CREEK BASIN, COLORADO  
SPRING, 1978



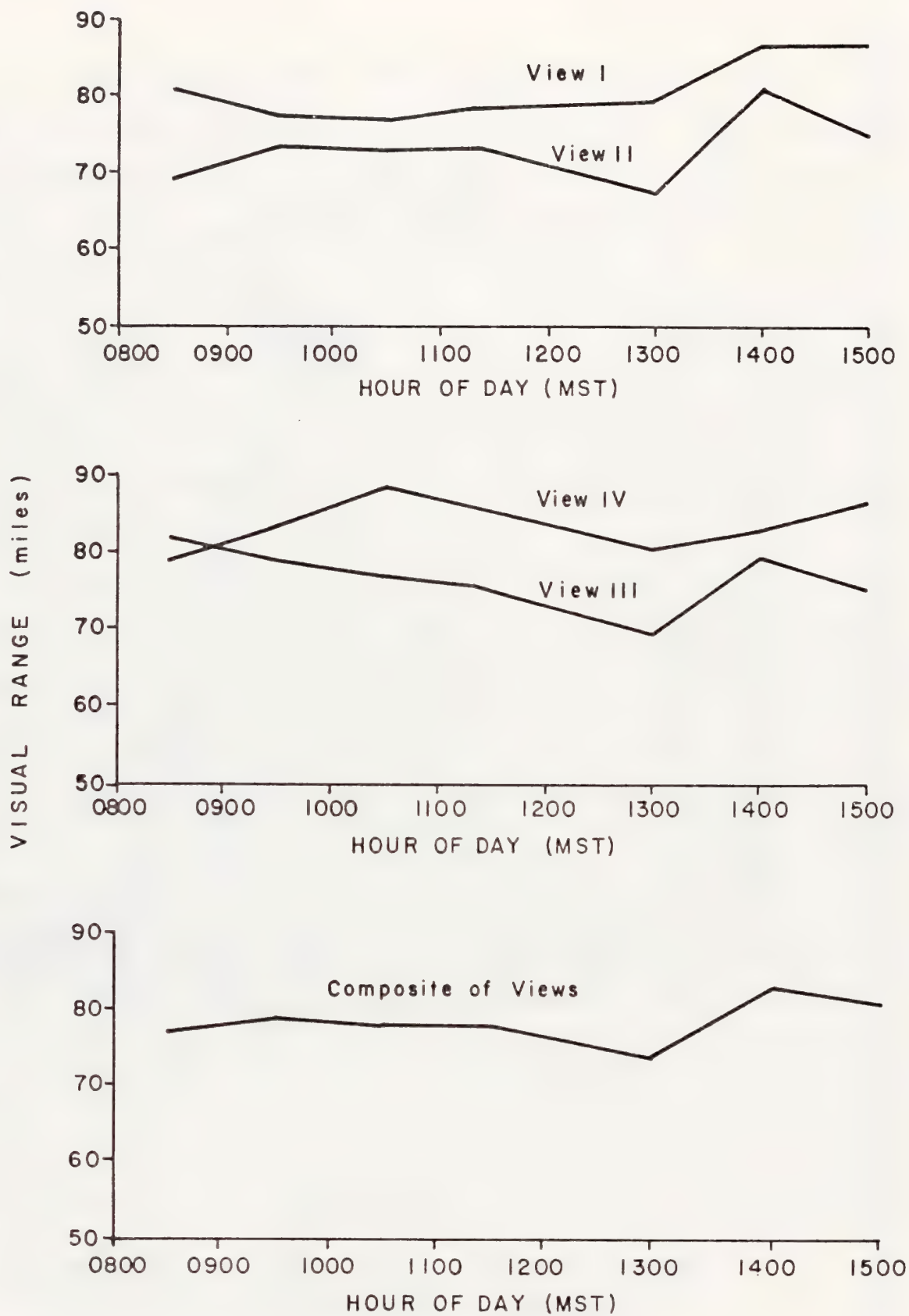


FIGURE 5  
VARIATION IN THE MEAN HOURLY VISUAL RANGE  
PICEANCE CREEK BASIN, COLORADO  
SPRING, 1978

## REFERENCES

- Dames & Moore, 1976. Quarterly Report - Spring, 1976 Documentation of Visibility in the Piceance Creek Basin for Rio Blanco Oil Shale and C-b Shale Oil Projects, p. 19
- Valley, Shea L., Handbook of Geophysics and Space Environments, Air Force Cambridge Research Lab., p 7-4.

## APPENDICES



## APPENDIX A-1

## HOURLY VISUAL RANGE - PICEANCE CREEK BASIN, COLORADO - SPRING, 1978

HOUR	View	4/6	4/12	4/18	4/24	4/30				5/6	5/12	5/18	5/24	5/30	
0830	1	126	84	82	84	51				58	103	72	70	81	81.1
	2	112	81	72	65	32				45	88	64	63	70	69.2
	3	103	91	73	75	40				74	132	82	72	79	82.1
	4	-	107	112	90	50				45	89	71	69	78	79.0
0930	1	100	84	82	84	61				58	93	72	70	70	77.4
	2	92	88	72	65	-				45	95	88	54	63	73.6
	3	109	91	73	83	34				40	114	98	65	79	78.6
	4	134	116	88	107	51				45	97	61	78	86	86.3
1030	1	81	84	82	84	71				-	93	83	57	57	76.9
	2	92	81	79	81	42				45	88	88	63	70	72.9
	3	94	91	73	83	38				45	106	98	65	72	76.5
	4	126	107	88	90	35				-	106	71	94	78	88.3
1130	1	91	84	92	84	76				58	93	93	57	57	78.5
	2	78	81	72	81	68				56	95	95	54	54	73.4
	3	72	83	81	91	58				40	98	106	65	65	75.9
	4	94	133	112	99	50				45	114	50	86	69	85.2
1300	1	91	94	82	84	76				58	93	103	57	57	79.5
	2	78	88	72	73	63				37	80	80	44	63	67.8
	3	109	83	81	75	21				17	98	82	72	57	69.5
	4	102	124	88	99	59				50	71	61	69	78	80.1
1400	1	109	104	82	94	84				-	93	93	57	70	87.3
	2	98	88	72	73	81				-	80	102	70	63	80.8
	3	94	100	73	91	53				43	90	106	79	65	79.4
	4	110	99	79	90	36				74	80	106	78	86	83.8
1500	1	118	104	82	84	72				-	93	103	57	70	87.0
	2	105	88	72	73	76				-	80	80	44	54	74.7
	3	94	91	81	75	42				37	90	123	57	65	75.5
	4	142	81	79	72	51				79	89	123	86	69	87.1
Daily	1	102.3	91.1	83.4	85.4	70.1				58.0	94.4	88.4	60.7	66.0	
Avq.	2	93.6	85.0	73.0	73.0	60.3				45.6	86.6	85.3	56.0	62.4	
	3	96.4	90.0	76.4	81.8	40.8				42.2	104.0	99.3	67.8	68.8	
	4	118.0	109.6	92.3	92.4	74.4				56.3	92.3	77.6	80.0	77.7	
		102.2	93.9	81.3	83.2	54.5				49.7	94.3	87.6	66.1	68.8	

APPENDIX A-2

SITE LOG SHEETS

4/06/78

MST

- 0750 - Arrived site. Windy not too cold. Some sunshine but cloudy overhead. All views good visibility. Clouds on H on View 4. Road dry.
- 0830 - All views good - cl on hz on View 4 only. Real overcast on View 4. No haze anywhere. Still windy from southeast. Kinda unusual? Sun behind large cloud.
- 0930 - No haze. Clouds on H on View 4 only. Still windy, a little more sunshine.
- 1030 - Some haze, View 1 & 2. Shadows on View 1 & 2. Still windy, some sunshine with high wispy clouds.
- 1130 - High cloudiness, sun shining. Light hz on View 1 & 2. Cl on H on View 1, 2, 3.
- 1300 - High cloudiness, sun shining. Lt hz. View 1. Cl on H on View 1, 2, 3. Warm 50+ and windy.
- 1400 - High clouds. with sun, real light hz. View 1 & 2. Real clear on View 3 & 4. Shadows on View 1 & 2.
- 1500 - High clouds, general overcast, not too much sun. Light hz View 1 & 2 clear on View 3 & 4. Has been windy, blustry type spring day.

# SITE LOG SHEETS

4/12/78

MST

- 0800 - Arrived site. Fantastic morning. Not a cloud in sky. Sunny.
- 0830 - No change. Light hz all views snow on View 3 & 4. Not too cold. No breeze. Hz a little more to the west.
- 0930 - Nice - slight breeze - SW. View 1 & 2. Have lt hz while View 3 & 4. Not too cold no breeze hz a little more to the west.
- 1030 - Same as 0930. Breeze picking up a little.
- 1130 - Lt Hz View 1. View 2, 3, 4 clear few scattered clouds. No cl on H some breeze from SW - Nice out.
- 1200 - Getting windy. Some scattered clouds. Very little hz on View 1 & 2. 3 & 4 clear. Still sunny most times clouds coming from east.
- 1400 - Windy with some pretty good gusts. Lt hz on View 1. View 2, 3, & 4 clear. More clouds.
- 1500 - Still windy - Snow on View 3. Almost gone. Some hz View 1. All other views clear. Not too warm now, otherwise real nice day.

Depart site



# SITE LOG SHEETS

4/18/78

MST

- 0800 - Arrived site. Calm, mostly clear. All views visible.
- 0830 - Sunny with some cl. Lt hz all views. Cl on H on Views 2,3, 4. No cl on View 1, a patch of shadow between site & View 1. Not too cold. Snow on View 4.
- 0930 - Cl on H on View 3 & 4. Calm and real nice. Snow is gone on all views except View 4. Seem hazy in all directions today - windy yesterday.
- 1030 - Has turned windy, hz is almost gone except View 1. Cl on H on View 3 & 4. A few scattered cl now to the N.
- 1130 - Still windy, shadow on View 2. Ht hz. View 1 - Rest are clear scattered cl and sunny.
- 1300 - Continues to be windy - Lt hz View 1 & 2. Clear to the east.
- 1400 - No change - very few clouds left in sky now.
- 1500 - Same - Windy but otherwise has been a real nice day.

Depart site

## SITE LOG SHEETS

4/24/78

MST

- 0800 - Calm, sunny day. All views visible. Some hz all views
- 0830 - No change. A few high wispy cl. Snow on View 4. No cl on H. Some dust or smoke in area of C-b worksite.
- 0930 - Cl on H View 1, 2, 3 - lt hz 1, 2, 3. No much Hz on View 4. Always heavier to the west. Small amount of dust can be seen from C-b work site. Sunny & lt. wind.
- 1030 - Cl on H View 1 & 2 lt hz west, View 3 & 4 not bad. Lt. wind has started.
- 1130 - Cl on horizon all views. Lt hz View 1 and 2. 3 & 4 mostly clear wind is picking up a little more. Sunny.
- 1300 - Quite a bit of wind, gusty. Cl on H all view lt hz. View 1 & 2 View 3 & 4 mostly clear becoming overcast.
- 1400 - Gusty winds at time. Cl on H all views. Shadow on View 3. Lt hz to the west, better to the east. Not as overcast as 1300.
- 1500 - Cl on H all views, Wind isn't quite as gusty, cloudy to the south Sunny - lt hz View 1 & 2, 3 & 4 pretty good.

Real nice day

## SITE LOG SHEETS

4/30/78

MST

- 0805 - View 1 & 2 covered with clouds View 3 & 4 can be seen but not too clear. Overcast with some sun, light wind blowing from SW. Rain last night some shower to west and northwest.
- 0830 - Same as 0805. Some clearing on skyline to west.
- 0930 - No sun. Light rain total overcast. Can see View 4 only clouds on View 1, 2, & 3. Pictures taken from inside cabin.
- 1030 - All views in clouds, however close objects all view are visible. Sunny to south. Windy. Not raining at site now.
- 1130 - View 2 & 4 visible. Rain showers. Some sun to south. View 3 heavy clouds. View 1 clouds.
- 1300 - Good rain at site - overcast can see View 1. View 2, 3, & 4 covered with clouds. Wind, light out of SW. No sun now.
- 1400 - View 1 - Visible - some light cls on View 2. View 3 & 4 are covered with clouds. Rain showers to View 4 sun shining again. But mostly overcast.
- 1500 - View 1 & 2 visible. View 3 & 4 in clouds. Some sun, but mostly cloudy. About same all day.

Depart site



# SITE LOG SHEETS

5/6/78

MST

- 0800 - 1" snow at site - overcast - with some sunshine. View 2 & 4 visible with cl on View 1 & 4. Calm. Some blue skys too mostly overhead.
- 0830 - Cl on H all views. View 1, 2, 3 visible. View 4 in clouds. Calm. Overcast right now. Radio says 100% for showers & or snow today.
- 0930 - View 1 & 2 visible. View 3 just barely visible. View 4 snowing. Wind calm, a bit more cloudy - seems to be closing in a bit.
- 1030 - Weather getting worse. Can only see View 2. Storm moving west to east. Real light wind. No sun. Light snow on all higher areas.
- 1130 - View 1, 2, 3 visible. Snowing View 4. No sun. No wind. No warmth. Light snow & rain showers at sight. Not much change.
- 1300 - View 1 & 2 visible. Snowing elsewhere. Just minutes after pictures were taken a snowstorm at site.
- 1400 - All views snowing. Some sun overhead good snowstorm from NW.
- 1400 - Snowing all views. Sun overhead some wind. Not too hot a day.

Depart site

NOTE: Forgot to change the month on calibration card!

# SITE LOG SHEETS

5/12/78

MST

- 0805 - Sunny with a few scattered clouds on horizon to North & NE. Breeze from SW. Nice morning.
- 0830 - Cl on H on View 3 & 4. Lt hz on View 1, 2, 3. View 4 real clear, snow on View 4. A low cl on 4 north & east. Sunny with breeze from SW. Some gusts.
- 0930 - Cl on H all views. Lt hz. View 1, 2, 3. View 4 clear. Light breeze and sunny. No dust at all from C-b work site, or from Ca either.
- 1030 - View 4 clearest I have ever seen. Cl on horizon View 1, 2, 3. Lt hz View 1 & 2. Sunny with breeze & some gusts from SW.
- 1130 - Cl on Horizon, View 1, 2, 3. View 4 real clear. Lt hz on 1 & 2. 3 is not bad. Sunny, light wind and some gusts.
- 1300 - Clear H on View 3. Lt hz View 1 and 2. View 3 and 4 clear. Almost a cloudless day - sunny - some wind and gusts.
- 1400 - No cl on H all views. View 1 light hz. View 2, 3, 4 are clean. Breeze blowing from W with some gusts. Clear & sunny.
- 1500 - No cl on H all views. Lt hz in west, cleaner to the east. Wind almost calm. Real nice day.

Depart site 1510

# SITE LOG SHEETS

5/18/78

MST

- 0800 - Skiff of snow on ground at site. Breeze from west, cool, scattered clouds. Some sunshine. View 1, 2, 3 visible, hz to the northwest. View 4 in clouds. Road has been graded.
- 0830 - View 1, 2, 3 visible, some hz. Cl on 4. All views - scattered cls some sun, breeze (cool) from west.
- 0930 - All views visible. Lt hz in east to considerable amounts in west -- snow on View 4. Scattered cl, some sun.
- 1030 - Same as 0930 but a little more wind. Some gusts.
- 1130 - Quite a bit of hz to the west and clear to the east. Mostly overcast with shadows from sun. Lt breeze from W.
- 1300 - Not much change.
- 1400 - Overcast at site, with shadows View 3 & 4. Lt. breeze with gusts.
- 1500 - View 4 in sunshine, overcast rest of views. Not much haze as wind is stronger now.

Depart site 1510



SITE LOG SHEETS

5/24/78

MST

- 0800 - Only 2 cl in sky - wind from SE? Quite a bit of haze seems heaviest to the NW.
- 0830 - Heavy H<sub>z</sub> on View 1 & 2. Moderate h<sub>z</sub> on View 3 & 4. View 4 has snow. Windy - out of SE. Sunny. Sometimes gusty.
- 0930 - Note quite as hazy as 0830 still windy. Not much change.
- 1030 - View 4 is clearing up. Must be the wind. Still hard to see View 1. Windy from SE with some good gusts. Sunny & nice.
- 1130 - Same as 1030, but starting to get some scattered clouds mostly north.
- 1300 - Fairly clear to the east but gets hazy to a point in where you can hardly see View 1. Wind is shaking the shelter? Real gusty. Quite a few clouds from the south.
- 1400 - Real hazy View 1, View 2 not quite so bad, light h<sub>z</sub>. View 3, to almost clear View 4. Windy, clouds are making some shadows.
- 1500 - Same as 1400 - However cl are no on H on View 1, 2, 3, very windy day storm moving in from NW.

Depart Site 1515

# SITE LOG SHEETS

5/30/78

MST

- 0755 - Pretty sunny morning. Light breeze from NE. All view visible  
Snow on View 4. All views lt. hz.
- 0830 - No cl or H View 1 & 2, 4, cl or h View 3, sunny with breeze from  
NW. Seems to be more hz in the NE than even before. Snow on  
View 4.
- 0930 - Weather about the same. No cl on h now. Some cl to the north.  
Light hz all views.
- 1030 - Not much change. View 4 may be a bit clearer. Seems like more hz  
in area of Rio Blanco.
- 1130 - Cloudy to the east. Wind from west. Lt hz all views. Cool  
outside.
- 1300 - Wind from NW. Cloudy over much of the south and east. View  
4 much clearer and View 1 has more hz.
- 1400 - Overcast - some shadows. Cl on 4. All views moderate hz to the  
west to lt hz in the East. Still windy looks like some showers to  
the East.
- 1500 - Overcast - generally cloudy everywhere. Still windy getting  
pretty hazy in the east, View 4.

Depart site 1510

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## II B-5 NOISE

This section deals with environmental noise. Occupational noise exposure is covered under Health and Safety.

Traffic noise measurements are made one day per week approximately at morning shift change at Stations II and IX (Figure II B-5) along Piceance Creek road and on the access road at the tract boundary respectively. The general radio 1565 sound level meter (SLM) is used to measure peak noise levels at A weighting. Background levels (i.e., no traffic) are obtained the same day at A, B, C weightings. Results are presented on Tables II B-45 through II B-56 for April through September 1978.

Tract noise surveillance has been determined since February 1978, at Station XV (Figure II B-5) located in the vicinity of proposed ancillary development activity. The B & K precision SLM (model 2203) is located on the tract northern boundary. Continuous noise measurements at A weightings are made for 24 hours every 6th day. Results are presented on Tables II B-57 through II B-62 for April through September 1978. The single station acts as a control during off-shift or "quiet" intervals and as a development site during operational periods of the day.

See Section IV for four-digit Station computer codes.



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- Figure II B-5

TRACT C-b NOISE STUDY DATA SHEET

DATE: 4-20-78

TEMPERATURE: 12°C  
WIND SPEED: 15 mph SWMETER TYPE: General Radio 1565-B  
METER ID#: 28612  
MICROPHONE SERIALS NO.: 44682

SITE	TIME (MST)	WEIGHTING (A, B, C.) + READING (db)	METER RESPONSE  S = SLOW F = FAST	COMMENTS		VEHICLE INFORMATION
				POSITION OF OBSERVER	POSITION OF MICROPHONE WITH RESPECT TO NOISE	
042	1045	A 40-45 Wind Noise	S	East of Main Shaft	90°	
Site Boundary cess Road	1115 to 1130	A 85 65 66 70 65 65 85 63 85 60	S	On Road	90° SB NB SB NB NB NB NB NB NB NB NB	Water Truck Car Pickup Ford Pickup Chevy Pickup Pickup Pickup Dump Truck Chevy Pickup Water Truck Blazer
North of Road at P & L Gate Entrance	1135	A 55 BACKGROUND FROM ROAD MACHINERY 65  55 65 80 70 68 50 70 67	S	-----	North of Highway EB WB EB EB WB WB WB EB WB EB	Car Car Pickup Dump Truck Pickup Car Car Dump Truck Pickup



TRACT C-b NOISE STUDY DATA SHEETDATE: 5-22-78TEMPERATURE: 21°CWIND SPEED: 10-15 SoutherlyMETER TYPE: General Radio 1565-BMETER ID#: 28612MICROPHONE SERIAL NO.: 44682

SITE	TIME (MST)	WEIGHTING (A, B, C) + READING (db)	METER RESPONSE  S = SLOW F = FAST	COMMENTS		VEHICLE INFORMATION
				POSITION OF OBSERVER	POSITION OF MICROPHONE WITH RESPECT TO NOISE	
042 East of Ancillary	0900	A 55 dB Aug.	S	East of Ancillary	90°	
Guard Track West Access Road	0915	78 dB	S	At Guard Gate	90°	Water Truck S
	0930	77 dB	S			Water Truck N
	0932	72 dB	S			Car S
	0937	73 dB	S			Water Truck N
	0939	62 dB	S			P/U N
	0941	83 dB	S			Semi S
	0945	77 dB	S			Water Truck N
	0947	70 dB	S			P/U S
	0954	68 dB	S			P/U S
Piceance Creek Entrance	1006	65 dB	S	North side of Highway	90°	Gravel Truck S
	1007	68 dB	S			Gravel Truck S
	1007	68 dB	S			Gravel Truck S
	1011	85 dB	S			P/U S
	1012	70 dB	S			Gravel Truck S
	1013	63 dB	S			Gravel Truck S
	1013	85 dB	S			Gravel Truck N
	1014	63 dB	S			Gravel Truck W

TRACT C-b NOISE STUDY DATA SHEET

DATE: 6-30-78

TEMPERATURE: 27°CWIND SPEED: 0-5 mphMETER TYPE: General Radio 1565-BMETER ID#: 28612MICROPHONE SERIAL NO.: 44682

SITE	TIME (MST)	WEIGHTING (A, B, C) + READING (db)	METER RESPONSE  S = SLOW F = FAST	COMMENTS		VEHICLE INFORMATION
				POSITION OF OBSERVER	POSITION OF MICROPHONE WITH RESPECT TO NOISE	
042	0900-0930	Avg. 48	S	East of Ancillary	90°	---
Guard Station (	1000 MST  1012	Avg. 41  54-----	S	East of Guard Station	90°	---Car North
North Piceance Creek Entrance	1025 MST  1025----- 1026----- 1026----- 1029----- 1036----- 1037----- 1040----- 1141----- 1145----- 1148----- 1148----- 1149-----	Avg. 44  54----- 58----- 53----- 58----- 59----- 62----- 52----- 91----- 76----- 52----- 65----- 68-----	S	South Side of Highway	90°  (E)- (W)- (S)- (N)- (S)- (E)- (N)- (E)- (E)- (W)- (W)- (N)-	Truck Semi Car Truck Semi Car Car Semi Truck Car Car Truck

TRACT C-b NOISE STUDY DATA SHEET

DATE: 7-27-78

TEMPERATURE: 75° - 80° FWIND SPEED: 2-5 SEMETER TYPE: General Radio 1565-BMETER ID#: 28612MICROPHONE SERIAL NO.: 44682

SITE	TIME (MST)	WEIGHTING (A, B, C) + READING (db)	METER RESPONSE  S = SLOW F = FAST	COMMENTS		VEHICLE INFORMATION
				POSITION OF OBSERVER	POSITION OF MICROPHONE WITH RESPECT TO NOISE	
042	0800	Avg.: Less than 50	S	East of Ancillary	90°	
North Piceance Creek Entrance	0840	Avg.: 66	S	South side of Highway	90°	Road Paving Equipment
Guard Shack	0850	Avg.: Less than 50	S	Front entrance of shack	90°	
	0855	61	--	--	--	Pickup S
	0857	74	--	--	--	Cement Trk. S
	0901	62	--	--	--	Car N
	0903	61	--	--	--	Truck S
	0904	63	--	--	--	Pickup S
	0905	62	--	--	--	Car N
	0905	59	--	--	--	Pickup S
	0907	52	--	--	--	Pickup S
	0910	62	--	--	--	Water Truck N
	0912	66	--	--	--	Water Truck N
	0913	71	--	--	--	Airplane W
	0922	80	--	--	--	Water Truck S
	0923	59	--	--	--	Pickup N



TRACT C-b NOISE STUDY DATA SHEET

DATE: 8-11-78

TEMPERATURE: 20 - 25°CWIND SPEED: 0-5 SEMETER TYPE: General Radio 1565-BMETER ID#: 28612MICROPHONE SERIAL NO.: 44862

SITE	TIME (MST)	WEIGHTING (A, B, C) + READING (db)	METER RESPONSE  S = SLOW F = FAST	COMMENTS		VEHICLE INFORMATION
				POSITION OF OBSERVER	POSITION OF MICROPHONE WITH RESPECT TO NOISE	
Gasoline Storage Area	0730 - 0740	Avg.: 58	S	West of Gas Tanks	90°	General
042	0745- 0751	Avg.: Less than 50	S	East of Ancillary	90°	N/A
Adm. Offices	1225- 1240	Avg.: 55	S	North Parking Lot	90°	N/A
Guard Shack	1243	Avg.: Less than 50	S	East of Shack	90°	
	1246	55	--	--	90°	Car N
	1247	52	--	--	90°	Thunder
	1248	61	--	--	90°	Truck
	1250	59	--	--	90°	Car N
	1253	63	--	--	90°	Truck N
	1303	79	--	--	90°	Water Truck S
	1304	63	--	--	90°	Truck N
	1307	76	--	--	90°	Dump Truck S
	1310	72	--	--	90°	Dump Truck S
	1310	76	--	--	90°	Water Truck N
	1311	52	--	--	90°	Van N
	1312	62	--	--	90°	Truck N
	1313	59	--	--	90°	Car N
	1313	55	--	--	90°	Truck S
	1315	82	--	--	90°	Water Truck
	1316	54	--	--	90°	Truck
	1317	63	--	--	90°	Gas Truck S

TRACT C-b NOISE STUDY DATA SHEET

DATE: 8-11-78 page 2

TEMPERATURE: 20-25° CWIND SPEED: 0 - 5 SEMETER TYPE: General Radio 1565-BMETER ID#: 28612MICROPHONE SERIAL NO.: 44862

SITE	TIME (MST)	WEIGHTING (A,B,C) + READING (db)	METER RESPONSE  S = SLOW F = FAST	COMMENTS		VEHICLE INFORMATION
				POSITION OF OBSERVER	POSITION OF MICROPHONE WITH RESPECT TO NOISE	
North Entrance Piceance Creek	1327	Avg.: Less than 50	S	North Side of Highway	90°	
	1328	61	--	--	90°	Truck W
	1329	85	--	--	90°	Semi W
	1330	65	--	--	90°	Truck W
	1330	68	--	--	90°	Truck E
	1331	86	--	--	90°	Semi W
	1334	72	--	--	90°	Truck W
	1335	69	--	--	90°	Truck E
	1335	67	--	--	90°	Truck W
	1336	63	--	--	90°	Thunder
	1340	72	--	--	90°	Truck E
	1341	66	--	--	90°	Truck N
	1341	64	--	--	90°	Car N
	1342	69	--	--	90°	Truck E
	1342	65	--	--	90°	Van S

TRACT C-b NOISE STUDY DATA SHEET

DATE: 8-17-78

TEMPERATURE: 15-20

WIND SPEED: 10-20 mph SW  
Gusts - 20-25 mph

METER TYPE: General Radio 1565-B

METER ID#: 28612

MICROPHONE SERIAL NO.: 44682

SITE	TIME (MST)	WEIGHTING (A, B, C) + READING (db)	METER RESPONSE  S = SLOW F = FAST	COMMENTS		VEHICLE INFORMATION
				POSITION OF OBSERVER	POSITION OF MICROPHONE WITH RESPECT TO NOISE	
Adm. Offices	0730- 0745	Avg.: 50	S	North Parking Lot	90°	
042	0815- 0820	Avg.: Less than 50	S	East of Ancillary	90°	
Gasoline Storage Area	0830- 0840	Avg.: 63	S	East of Gas Tanks	90°	Heavy Equip- ment
Guard Shack	0850	Avg.: Less Than 50	S	East of Shack	90°	
	0853	53	--	--	--	Pickup N
	0900	62	--	--	--	Gravel Truck N
	0901	83	--	--	--	Water Truck S
	0914	64	--	--	--	Pickup S
	0917	68	--	--	--	Car S
	0921	65	--	--	--	Pickup S
	0926	61	--	--	--	Pickup S
	0935	63	--	--	--	Pickup S
	0936	(55 - 59)	--	--	--	Wind Gusts
North Entrance Piceance Creek	1005 -	Avg.: Less than 50	S	North Side of Highway	90°	
	1006	72	--	--	--	Semi W
	1006	64	--	--	--	Propane Truck W
	1007	71	--	--	--	Dump Truck E
	1007	60	--	--	--	Pickup E
	1010	53	--	--	--	Pickup E
	1012	73	--	--	--	Dump Truck W
	1015	56	--	--	--	Car W
	1016	61	--	--	--	Pickup E
	1017	59	--	--	--	Pickup S
	1020	68	--	--	--	Dump Truck W
	1021	58	--	--	--	Pickup N



TRACT C-b NOISE STUDY DATA SHEET

DATE: 8-17-78 page 2

TEMPERATURE: 15-20METER TYPE: General Radio 1565-BMETER ID#: 28612WIND SPEED: 10-20 mph SW  
Gusts - 20-25 mphMICROPHONE SERIAL NO.: 44682

SITE	TIME (MST)	WEIGHTING (A,B,C) + READING (db)	METER RESPONSE  S = SLOW F = FAST	COMMENTS		VEHICLE INFORMATION
				POSITION OF OBSERVER	POSITION OF MICROPHONE WITH RESPECT TO NOISE	
	1023	57	--	--	--	Car W
	1024	65	--	--	--	Semi E
	1028	78	--	--	--	Semi E
	1033	63	--	--	--	Car S

TRACT C-b NOISE STUDY DATA SHEET

DATE: 8-24-78

TEMPERATURE: 29°C

WIND SPEED: 10-15 SW

METER TYPE: General Radio 1565-B

METER ID#: 28612

MICROPHONE SERIAL NO.: 44862

SITE	TIME (MST)	WEIGHTING (A,B,C) + READING (db)	METER RESPONSE  S = SLOW F = FAST	COMMENTS		VEHICLE INFORMATION
				POSITION OF OBSERVER	POSITION OF MICROPHONE WITH RESPECT TO NOISE	
042	1330-1345	A - 40-45 Avg.	S	East of Ancillary	90°	N/A
Parking Lot	1345-1400	Avg.: Less than 55	Slow Response	South of Work Area		
Ground Shack	1400	57		South of Shack	90°	Water Truck S
	Background level less than 50db	48	--	--	--	UPS Truck N
		50	--	--	--	Truck N
		55	--	--	--	Truck N
		49	--	--	--	Panel N
		50	--	--	--	Pickup
		54	--	--	--	Dump Truck
		50	--	--	--	Dump Truck
		52	--	--	--	Truck N
		51	--	--	--	Truck N
		48	--	--	--	Car S
		49	--	--	--	Pickup S
Turn off C-b Entrance	1420					
	Background level less than 50db	48	--	--	--	Bus S
		54	--	--	--	Truck W
		56	--	--	--	Stawag E
						Pickup E
		71	--	--	--	Dump Truck E
		56	--	--	--	Car E
		58	--	--	--	Dump Truck W
		52	--	--	--	Car E
		60	--	--	--	Dump Truck W
		56	--	--	--	Car

TRACT C-b NOISE STUDY DATA SHEET

DATE: 8-24-78 page 2

TEMPERATURE: 29<sup>0</sup> CWIND SPEED: 10-15 SWMETER TYPE: Gen. Radio 1565-BMETER ID#: 28612MICROPHONE SERIAL NO.: 44862

SITE	TIME (MST)	WEIGHTING (A, B, C) + READING (db)	METER RESPONSE  S = SLOW F = FAST	COMMENTS		VEHICLE INFORMATION
				POSITION OF OBSERVER	POSITION OF MICROPHONE WITH RESPECT TO NOISE	
C-b Entrance	1445	A	S	South of Highway	90 <sup>0</sup>	
		58	--	--	--	Car E
		70	--	--	--	Dump Truck W
		60	--	--	--	Pickup W
		56	--	--	--	Pickup W
		68	--	--	--	Truck E
		50	--	--	--	Pickup W
		52	--	--	--	Pickup E
	End of Study @1510 MST					



TRACT C-b NOISE STUDY DATA SHEET

DATE: 8-30-78

TEMPERATURE: 30°CWIND SPEED: 10-15 WMETER TYPE: General Radio 1575-BMETER ID#: 28612MICROPHONE SERIAL NO.: 44862

SITE	TIME (MST)	WEIGHTING (A, B, C) + READING (db)	METER RESPONSE  S = SLOW F = FAST	COMMENTS		VEHICLE INFORMATION
				POSITION OF OBSERVER	POSITION OF MICROPHONE WITH RESPECT TO NOISE	
042	1420	Avg.: Less than 50	S	East of Tract	90°	-- 0 --
Parking Lot	1430-1445	Avg.: 58	S	Above Work Area		-- 0 --
Guard ack	1450	Avg.: Less than 50 68	--	West of Road	90°	C-b Bus
		65	--	--	--	Ford Pickup
		68	--	--	--	Dump Truck N
		62	--	--	--	Pickup
	1515	82	--	--	--	Dump Truck S
		62	--	--	--	C-b Bus S
		60	--	--	--	Car S
		65	--	--	--	Pickup S
		65	--	--	--	C-b Bus S
		62	--	--	--	Pickup S
		62	--	--	--	Pickup S
		63	--	--	--	Car S
	1530	61	--	--	--	Car N
C-b Turn Off Piceance C A.R.D.	1535	80	--	20' South of Roadway	--	Truck N
		68	--	--	--	Pickup N
		65	--	--	--	Car W
		72	--	--	--	Truck W
		78	--	--	--	Dump Truck E
		72	--	--	--	Vega E
		75	--	--	--	Pickup E
		79	--	--	--	Dump Truck E
		65	--	--	--	Dodge Truck E
		65	--	--	--	Dump Truck W
		68	--	--	--	Car E

TRACT C-b NOISE STUDY DATA SHEET

DATE: 9-7-78

TEMPERATURE: 30°CWIND SPEED: 10-15 mph SWMETER TYPE: General Radio 1565-BMETER ID#: 28612MICROPHONE SERIAL NO.: 44862

SITE	TIME (MST)	WEIGHTING (A, B, C) + READING (db)	METER RESPONSE  S = SLOW F = FAST	COMMENTS		VEHICLE INFORMATION
				POSITION OF OBSERVER	POSITION OF MICROPHONE WITH RESPECT TO NOISE	
Main Park- ing Lot	1300	A - 52 av	S	Above Work Area	90°	
042	1305	Avg.: Less Than 50	S	East of Ancillary	90°	
C and Shack	1310	65	S	At Shack	90°	VW Car S
		62	S	--	--	Dodge Car S
		66	S	--	--	Pickup N
		68	--	--	--	Car S
		63	--	--	--	Pickup S
		64	--	--	--	Car N
		64	--	--	--	Dodge S
		62	--	--	--	Pickup S
		65	--	--	--	Truck S
		60	--	--	--	Pinto S
		75	--	--	--	Truck S
		78	--	--	--	Dump Truck S
		70	--	--	--	Water Truck W
		72	--	--	--	Dump Truck S
		75	--	--	--	Dump Truck N
		75	--	--	--	Dump Truck S
	1400					
C-b Entrance at Piceance Creek Road	1405	68	S	South Side of Highway	90°	Car E
		67	--	--	--	Pickup E
		80	--	--	--	Dump Truck E
		81	--	--	--	Dump Truck E
		62	--	--	--	Car W
		65	--	--	--	Truck W
		78	--	--	--	Car W
		65	--	--	--	Car E
	1430					

TRACT C-b NOISE STUDY DATA SHEET

DATE: 9-15-78

TEMPERATURE: +15°WIND SPEED: 10-15 SWMETER TYPE: General Radio 1565-BMETER ID#: 28612MICROPHONE SERIAL NO.: 44862

SITE	TIME (MST)	WEIGHTING (A,B,C) + READING (db)	METER RESPONSE ALL S = SLOW F = FAST	COMMENTS		VEHICLE INFORMATION
				POSITION OF OBSERVER	POSITION OF MICROPHONE WITH RESPECT TO NOISE	
042	0910	Avg.: 60	S	On path to 042	90°	Background and Wind Noise
Guard House	0920	70	S	West of Access Road	90°	Background •
		84	--	--	--	Pickup
		78	--	--	--	Blazer
		82	--	--	--	Semi
		72	--	--	--	Semi
		74	--	--	--	Semi
		68	--	--	--	Station Wagon
		72	--	--	--	Semi
		66	--	--	--	Pickup
Piceance Creek Road at C-b Entrance	0940	65	S	North Side of Road	90°	Wind
		73	--	--	--	Pickup
		78	--	--	--	Semi
		73	--	--	--	Compact
		76	--	--	--	Pickup
		66	--	--	--	Pickup
		67	--	--	--	Car
		65	--	--	--	Car
		66	--	--	--	Station Wagon
		79	--	--	--	Semi



TRACT C-b NOISE STUDY DATA SHEET

DATE: 9-20-78

TEMPERATURE: 8°CWIND SPEED: - 0 -METER TYPE: General Radio 1565-BMETER ID#: 28612MICROPHONE SERIAL NO.: 44862

SITE	TIME (MST)	WEIGHTING (A,B,C) + READING (db)	METER RESPONSE  S = SLOW F = FAST	COMMENTS		VEHICLE INFORMATION
				POSITION OF OBSERVER	POSITION OF MICROPHONE WITH RESPECT TO NOISE	
042	0815	Avg.: Less Than 50	S	East of Tract	90°	N/A
Adm. Bldg.	0830	Avg.: 60	S	Parking Lot		
Guard Shack	0900	Avg.: 50	S	--	90°	
	0905	58	--	--	--	Pickup S
	0910	65	--	--	--	Car S
	0911	63	--	--	West of Road	Pickup S
		63	--	--	--	Pickup N
	0920	59	--	--	--	Olds Car S
	0930	85	--	--	--	Truck S
		78	--	--	--	Dump Truck S
		63	--	--	--	Pickup S
		65	--	--	--	Truck S
		62	--	--	--	Pickup S
		72	--	--	--	Water Truck N
		62	--	--	--	Pickup N
		65	--	--	--	Pickup N
		72	--	--	--	Dump Truck N
		75	--	--	--	Dump Truck N
		75	--	--	--	Dump Truck S
		80	--	--	--	Pickup E
C-b Entrance	1000	65		North Side of Road		Dump Truck S
		60	--	--	--	Pickup N
		55	--	--	--	Car N
		58	--	--	--	Pickup W
		78	--	--	--	Tank Truck W
		80	--	--	--	Tank Truck E
		65	--	--	--	Pickup W
		60	--	--	--	Car W
		75	--	--	--	Car W

## TABLE II B-56

TRACT C-b NOISE STUDY DATA SHEET

DATE: 9-29-78

TEMPERATURE: \_\_\_\_\_

METER TYPE: General Radio 1565-B

METER ID#: 28612

WIND SPEED: - 0 -

MICROPHONE SERIAL NO.: 44862

SITE	TIME (MST)	WEIGHTING (A,B,C) + READING (db)	METER RESPONSE  S = SLOW F = FAST	COMMENTS		VEHICLE INFORMATION
				POSITION OF OBSERVER	POSITION OF MICROPHONE WITH RESPECT TO NOISE	
042	0800	Avg.: Less than 50	S	East of Ancillary	90°	- 0 -
Parking Lot	0830-0845	Avg.: 54 db	S	South of Work Area	90°	- 0 -
Guard Shack	1400	Avg.: Less than 40	S	30' West of Road	90°	
		65	--	--	--	Pickup S
		58	--	--	--	Car S
		80	--	--	--	Water Truck
		72	--	--	--	Concrete Truck
	1415	68	--	--	--	Pickup N
		61	--	--	--	Pickup N
		58	--	--	--	Car N
		65	--	--	--	Car S
		76	--	--	--	Semi S
	1430	59	--	--	--	Pickup S
C-b Entrance, Piceance Road	1435	85		North Side of Highway	90°	Truck W
		72	--	--	--	Pickup S
		80	--	--	--	Bus S
	1435	81	--	--	--	Bus S
		70	--	--	--	Car E
		65	--	--	--	Car S
		66	--	--	--	Car S
		72	--	--	--	Van E
		65	--	--	--	Car E
		68	--	--	--	Jeep S
		68	--	--	--	Blazer S

TABLE II B-57

NOISE DATA  
 SITE XV  
 24 HOUR, FIXED SITE MONITORING  
 METER TYPE B & K TYPE 2203  
 METER ID#672110  
 RECORDER TYPE B & K TYPE 2306  
 RECORDER ID#694343

1. START TIME 2. STOP TIME 3. CHART RANGE 4. WIND SPEED 5. WIND DIRECTION	PEAK db  1900 to 0700	PEAK db  0700 to 1900	AVERAGE db  1900 to 0700	AVERAGE db  0700 to 1900	<u>BACKGROUND</u>  TAKEN FROM 1900 - 0700
1. 1245 3/30/78 2. 1300 3/31/78 3. 40-90 db 4. 5-10 mph 5. SE	50	74	Less than 40	47	Less than 40
1. 1300 4/6/78 2. 1230 4/7/78 3. 40-90 db 4. 0 mph 5.	54	72	42	50	Less than 40
1. 1310 4/13/78 2. 1300 4/14/78 3. 40-90 db 4. 15-20 mph 5. S	None	76	None	60	None
1. 1300 4/19/78 2. 1300 4/20/78 3. 40-90 db 4. 0 mph 5.	62	65	Less than 40	42	Less than 40
1. 1400 4/25/78 2. 1330 4/26/78 3. 40-90 db 4. 20-25 mph 5. SW	49	74	Less than 40	54	Less than 40

4/13/78: Batterys went bad at 1800  
 Lot of wind noise at 1300 mst



TABLE II B-58

NOISE DATA  
 SITE XV  
 24 HOUR, FIXED SITE MONITORING  
 METER TYPE B & K TYPE 2203  
 METER ID#672110  
 RECORDER TYPE B & K TYPE 2306  
 RECORDER ID#694343

1. START TIME 2. STOP TIME 3. CHART RANGE 4. WIND SPEED 5. WIND DIRECTION	PEAK db  1900 to 0700	PEAK db  0700 to 1900	AVERAGE db  1900 to 0700	AVERAGE db  0700 to 1900	BACKGROUND  TAKEN FROM 1900-0700
1. 1305 5/1/78 2. 1330 5/2/78 3. 40-90 db 4. 4-6 mph 5. SE	45	60	LESS THAN 40	LESS THAN 40	LESS THAN 40
1. 1300 5/9/78 2. 1200 5/10/78 3. 40-90 db 4. 20 mph 5. S	61	78	LESS THAN 40	45	LESS THAN 40
1. 1200 5/15/78 2. 1116 5/16/78 3. 40-90 db 4. 15-20 mph 5. S	50	65	LESS THAN 40	LESS THAN 40	LESS THAN 40
1. 1310 5/18/78 2. 1215 5/19/78 3. 40-90 db 4. 8-10 mph 5. S	50	1300 to 1900 5/18/78 56	LESS THAN 40	1300 to 1900 5/18/78 40	LESS THAN 40
1. 1300 5/26/78  Battery Failure  No Data					

5/18/78 Power Source failed at about 0500 5/19/78

TABLE II B-59

NOISE DATA  
 SITE XV  
 24 HOUR, FIXED SITE MONITORING  
 METER TYPE B & K TYPE 2203  
 METER ID#672110  
 RECORDER TYPE B & K TYPE 2306  
 RECORDER ID#694343

1. START TIME 2. STOP TIME 3. CHART RANGE 4. WIND SPEED 5. WIND DIRECTION	PEAK db	PEAK db	AVERAGE db	AVERAGE db	BACKGROUND
	1900 to 0700	0700 to 1900	1900 to 0700	0700 to 1900	TAKEN FROM 1900 - 0700
1. 1200 5/31/78 2. 1200 6/1/78 3. 40-90 db 4. 2-5 mph 5. SW	50	52	LESS THAN 40	LESS THAN 40	LESS THAN 40
1. 1315 6/6/78 2. 1315 6/7/78 3. 40-90 db 4. 2-5 mph 5. SW	LESS THAN 40	60	LESS THAN 40	LESS THAN 40	LESS THAN 40
1. 1400 6/12/78 2. 1345 6/13/78 3. 40-90 db 4. 15-20 mph 5. S	LESS THAN 40	69	LESS THAN 40	LESS THAN 40	LESS THAN 40
1. 1300 6/19/78 2. 1320 6/20/78 3. 40-90 db 4. 5-10 mph 5. S	LESS THAN 40	57	LESS THAN 40	LESS THAN 40	LESS THAN 40
1. 1130 6/22/78 2. 1300 6/23/78 3. 40-90 db 4. 5-10 mph 5. SE	55	55	LESS THAN 40	LESS THAN 40	LESS THAN 40

## TABLE II B-60

NOISE DATA  
 SITE XV  
 24 HOUR, FIXED SITE MONITORING  
 METER TYPE B & K TYPE 2203  
 METER ID#672110  
 RECORDER TYPE B & K TYPE 2306  
 RECORDER ID#694343

1. START TIME 2. STOP TIME 3. CHART RANGE 4. WIND SPEED 5. WIND DIRECTION	PEAK db  1900 to 0700	PEAK db  0700 to 1900	AVERAGE db  1900 to 0700	AVERAGE db  0700 to 1900	BACKGROUND  TAKEN FROM 1900 - 0700
1. 1200 6/29/78 2. 1500 6/30/78 3. 40-90 db 4. 3-5 mph 5. S	50	52	LESS THAN 40	LESS THAN 40	LESS THAN 40
1. 1200 7/6/78 2. 1400 7/7/78 3. 40-90 db 4. 5-8 mph 5. S	51	48	LESS THAN 40	LESS THAN 40	LESS THAN 40
1. 1200 7/12/78 2. 1200 7/13/78 3. 40-90 db 4. 10 mph 5. S	48	54	LESS THAN 40	LESS THAN 40	LESS THAN 40
1. 1230 7/18/78 2. 1200 7/19/78 3. 40-90 db 4. 2-5 mph 5. S	67	57	LESS THAN 40	42	LESS THAN 40
1. 1200 7/25/78 2. 1200 7/26/78 3. 40-90 db 4. 6-8 mph 5. SW	58	62	LESS THAN 40	LESS THAN 40	LESS THAN 40



TABLE II B-61

NOISE DATA  
 SITE XV  
 24 HOUR, FIXED SITE MONITORING  
 METER TYPE B & K TYPE 2203  
 METER ID#672110  
 RECORDER TYPE B & K TYPE 2306  
 RECORDER ID#694343

1. START TIME	PEAK db	PEAK db	AVERAGE db	AVERAGE db	BACKGROUND
2. STOP TIME					
3. CHART RANGE	1900	0700	1900	0700	TAKEN FROM
4. WIND SPEED	to	to	to	to	1900 - 0700
5. WIND DIRECTION	0700	1900	0700	1900	
1. 1215 7/31/78					
2. 1215 8/1/78					
3. 40-90 db	74	68	LESS	LESS	LESS
4. 5-7 mph			THAN	THAN	THAN
5. SW			40	40	40
1. 1130 8/7/78					
2. 1200 8/8/78					
40-90 db	49	63	LESS	LESS	LESS
2-5 mph			THAN	THAN	THAN
NE			40	40	40
1. 1200 8/14/78					
2. 1200 8/15/78					
3. 40-90 db	50	59	LESS	LESS	LESS
4. 25 mph			THAN	THAN	THAN
5. S			40	40	40
1. 1200 8/17/78					
2. 1200 8/18/78					
3. 40-90 db	55	67	LESS	LESS	LESS
4. 15-20 mph			THAN	THAN	THAN
5. SW			40	40	40
1. 1200 8/24/78					
2. 1200 8/25/78					
3. 40-90 db	LESS	74	LESS	42	LESS
4. 10 mph	THAN		THAN		THAN
5. SE	40		40		40
1. 1200 8/30/78	Bad	1200-1700	Bad	Less	Bad
2. 1200 8/31/78	Amplifier		Amplifier	than	Amplifier
3. 40-90 db		62		40	
4. 0 mph	after		after		after
5. 1700	1700		1700		1700

TABLE II B-62

NOISE DATA  
 SITE XV  
 24 HOUR, FIXED SITE MONITORING  
 METER TYPE B & K TYPE 2203  
 METER ID#672110  
 RECORDER TYPE B & K TYPE 2306  
 RECORDER ID#694343

1. START TIME 2. STOP TIME 3. CHART RANGE 4. WIND SPEED 5. WIND DIRECTION	PEAK db  1900 to 0700	PEAK db  0700 to 1900	AVERAGE db  1900 to 0700	AVERAGE db  0700 to 1900	<u>BACKGROUND</u>  TAKEN FROM 1900 - 0700
1. 1200 9/5/78 2. 1200 9/6/78 3. 40-90 db 4. 5 mph 5. S	59	74	LESS THAN 40	48	LESS THAN 40
1. 1215 9/11/78 2. 1200 9/12/78 3. 40-90 db 4. 0 mph 5. none	64	74	LESS THAN 40	52	LESS THAN 40
1. 1200 9/16/78  NO DATA RECORDER FAILURE	_____	_____	_____	_____	_____
1. 1230 9/21/78 2. 1200 9/22/78 3. 50-100 db 4. 0 mph 5. none	66	77	LESS THAN 40	50	LESS THAN 40
1. 1200 9/28/78 2. 1300 9/29/78 3. 40-90 db 4. 8 mph 5. S	60	76	42	53	42

ATMOSPHERIC  
DIFFUSION STUDIES

PARTICULATE  
ANALYSIS





## II B-6 ATMOSPHERIC DIFFUSION STUDIES

A study on atmospheric diffusion for Tract C-b was submitted by Aero-Vironment, Inc., 145 Vista Avenue, Pasadena, California 91107. The report of that study follows.

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Report on  
TRACER STUDY AT THE  
FEDERAL PROTOTYPE OIL SHALE LEASE TRACT C-b  
IN RIO BLANCO, COLORADO

Prepared for  
C-b Shale Oil Venture  
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P.O. Box 2687  
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by  
Michael W. Chan and Melvin I. Smith

AeroVironment Inc.  
145 Vista Avenue  
Pasadena, California 91107

October 1978

## ACKNOWLEDGEMENTS

This experiment could not have been successfully conducted without the dedication and perseverance of the other members of the team, besides the authors. They are:

Jerry Thelen – the field manager

Al Morris – weather forecaster and consultant

Steve Hernandez, Bob Baxter and Floyd Mesler – instrument technicians

Gee Lowe, Sara Head and Jamie Yuan – field technicians

Ample guidance and cooperation was also given to us by Dr. George Fosdick of Occidental Oil Shale, Inc. throughout the experiment.

This report was typed and graphics for the report were prepared by the Information Management Department of AV under the direction of Diane Barker.

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### APPENDICES

- A. Meteorological Data
- B. Tracer Gas Release Data
- C. Tracer Gas Concentration Data



## 1. INTRODUCTION

The C-b Oil Shale Venture plans to construct and operate an ancillary facility consisting of two or more commercial-sized retorts on Federal Oil Shale Lease Tract C-b, which is located about 20 miles west of Rio Blanco, in Rio Blanco County, Colorado (Figure 1-1). This ancillary facility will permit the processing of a thick section of high grade oil shale, establish the environmental monitoring procedures, obtain operating experience for processing a cluster of retorts, and provide a site for the training of mine and processing personnel.

To secure an air quality permit for this operation from the Colorado Department of Health, an air quality impact assessment of the ancillary facility is required. This impact assessment has to demonstrate compliance with Prevention of Significant Deterioration (PSD) Regulations and National and State Ambient Air Quality Standards through detailed air pollution modeling. Since Tract C-b is located in complex terrain, readily available EPA models which were developed for flat land do not provide realistic answers. Thus, a complex terrain model, AVMSTM, developed by AeroVironment (Chan, et al, 1977) is being adjusted to the conditions on Tract C-b and will be used for assessing the impacts of the ancillary facility.

In order to ensure the applicability of the adjusted model, a model validation experiment was performed in September 1978 on Tract C-b. This experiment was originally planned to be carried out in late 1977 but inclement weather had prevented any successful attempts until the fall of 1978. In the interim, however, trial runs were made to test the equipment and procedure. Data collected during those trial runs were not meaningful because of equipment problems or because of unfavorable weather conditions. They have been presented elsewhere (Chan, 1978) and thus will not be repeated here.

This report gives a description of the experiment performed in September of 1978, presents the data collected, and discusses the results of the experiment.

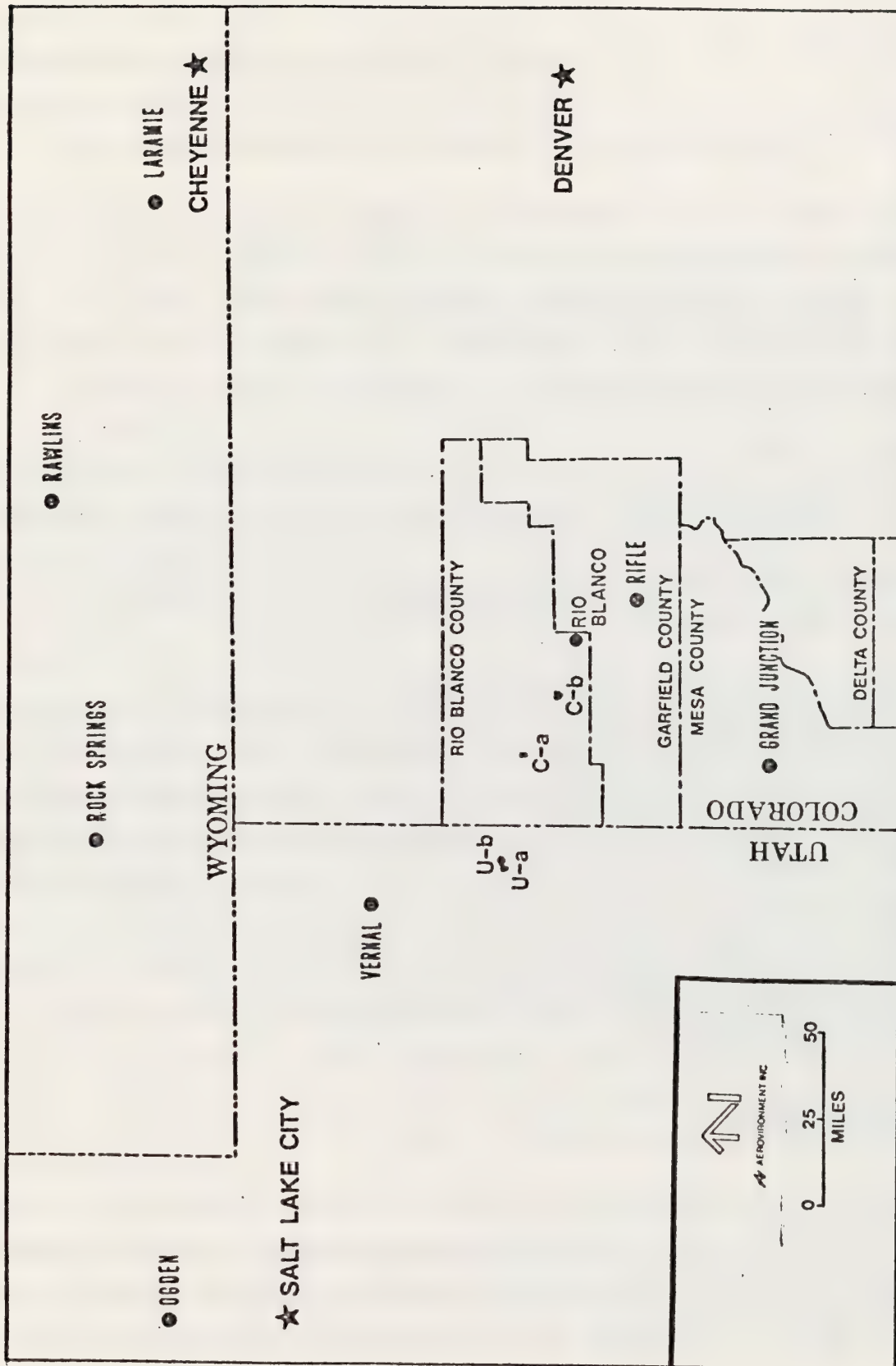


FIGURE 1-1. Regional map showing location of Tract C-b.

## 2. THE EXPERIMENT

The objective of the experiment was to simulate the transport and dispersion of emissions from an elevated source in the vicinity of the proposed ancillary facility under meteorological conditions conducive to high ground level concentrations.

For inert pollutants, the meteorological conditions of interest consist of low wind speed, persistent wind direction, and a neutral or stable atmospheric structure. Another situation of concern occurs when solar heating in the morning destroys a nocturnal radiation inversion, bringing high concentrations to the surface along the plume center-line. This process is known as fumigation.

Of course, an ideal experiment would be to determine the transport and dispersion of pollutants under all imaginable meteorological conditions. But since resources are limited, the days on which such an experiment would be performed should consist of a well-established nocturnal radiation inversion, followed by the destruction of that inversion in the morning, which is preceded or followed by a neutral atmospheric condition.

Since November 1977, a watchful eye was kept on the weather over the tracts by Mr. Alvin Morris of Ambient Analysis, Inc., through the winter and spring of 1978. Unfortunately, the conditions we were looking for never lasted long enough to allow the experiment to be conducted. No action was taken during the summer since atmospheric turbulence is usually higher as a result of stronger and longer solar heating of the earth's surface; which means quicker dispersion of pollutants and thus would not provide the ideal situation conducive to high concentrations. The early fall of 1978 had a number of days with the desired conditions, however, and the experiment was finally conducted on the 14th and 15th of September 1978.

### 2.1 Tracer Gas Releases

The simulation of emissions from an elevated source was accomplished by releasing sulfur hexafluoride ( $\text{SF}_6$ ) at an elevation that approximated the final height of the plume from the proposed ancillary facility (about 100 m above ground level). The  $\text{SF}_6$  gas was supplied by Air Products & Chemicals, Inc., with specifications of 99.65 vol % purity.  $\text{SF}_6$



was chosen as the tracer gas because it can be detected down to  $10^{-12}$  parts of  $\text{SF}_6$  per part of air (i.e., 1 ppt) and has a natural background of 0.0 to 0.1 ppt. It also possesses the following properties that makes it an ideal tracer gas:

- o Nontoxic, nonallergenic, nonradioactive, colorless and odorless.
- o Gaseous at ambient temperatures.
- o Chemically inert and thermally stable for atmospheric applications.
- o Capable of rapid and controlled atmospheric release from a point or area source.
- o Amenable to conventional and standardized collection techniques.
- o Commercially available at a reasonable price.

A Raven TRFD-1500 tethered balloon (Figure 2-1) was used to carry a one-inch plastic tubing to an altitude of about 100 m (330 feet) above the ground (Figure 2-2). The other end of the plastic tubing was attached to the  $\text{SF}_6$  cylinder (Figure 2-3).  $\text{SF}_6$  was then released at about 425 scmh. The pressure from the cylinder was sufficient to force the  $\text{SF}_6$  through the length of the tubing and allowed the gas to be released at the desired elevation.

A steady release rate was achieved by using a two-stage regulator and a rotometer which had been calibrated by use of a dry test meter. An Accu-Weight Model 300T scale was employed to measure the cylinder weights at 15-minute intervals. This arrangement is depicted in Figure 2-3. The tracer release rate was calculated from the difference in weight and was also cross-checked against the rotometer reading to assure that the release rate was constant.

The best location of release would have been the site of the ancillary facility. Ongoing construction at that site, however, prevented the release from taking place there. The second best location was on top of the immediate rise to the east of the

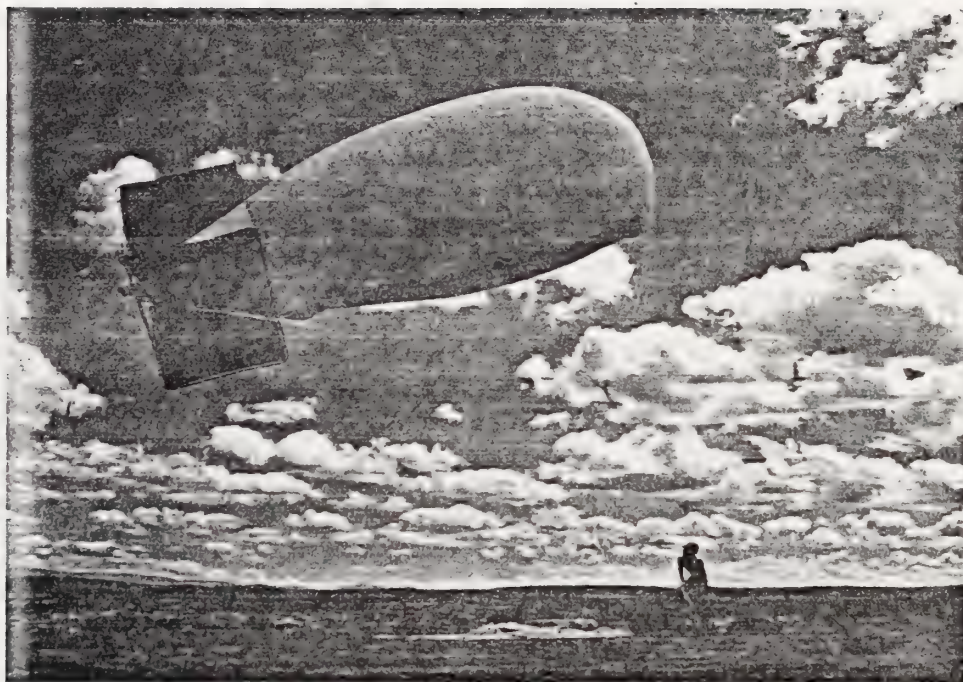


FIGURE 2-1. A Raven TRFD-1500 tethered balloon.

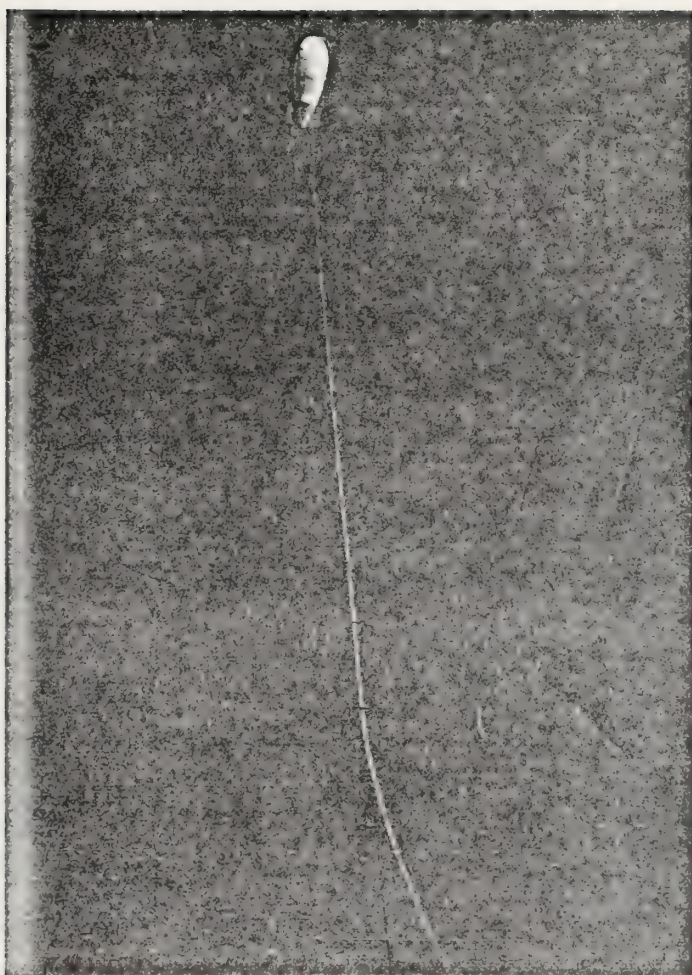


FIGURE 2-2. Release of  $\text{SF}_6$  at 100 m above ground level. The tubing that carried the  $\text{SF}_6$  was attached to the guy-wire of the tethered balloon.





FIGURE 2-3.  $\text{SF}_6$  was released from the bottle through a two-stage regulator and a rotometer. The bottle stood on an Accu-Weight Model 300T scale. To the left of the bottle is the motor-drive for regulating the height of the tethered balloon.

proposed facility because tracer gas released at this rise would be under the influence of the similar meteorological conditions affecting emissions from the ancillary facility and would thus be dispersed in a manner very similar to that of any emissions from the facility. Thus, during the experiment,  $\text{SF}_6$  was released on top of the rise, as shown in Figure 2-4.

## 2.2 Tracer Gas Collection

To determine how far and where the tracer gas was transported after it was released, as well as how fast the tracer gas was dispersed, air samples were collected at a number of fixed and random locations throughout the tract and analyzed for  $\text{SF}_6$  concentration.

There were a total of 23 fixed receptors, 22 of which are located in the expected downwind side of the  $\text{SF}_6$  release point. Most of those receptors were placed on both sides of the Piceance Creek where maximum impact was likely. Three receptors were situated south of the release point to provide background data during the early morning hours. Figure 2-5 shows locations of fixed receptors, the release site, and the expected plume centerline. A fold-out map in the pocket located in the back cover of this report provides similar information on a larger scale.

At the fixed locations, samples were collected by automatic sequential syringe samplers fabricated by AV (Figure 2-6). The sampler consists of a turntable mounted on a gear reducer coupled to a speed controlled DC motor. Mounted onto the turntable are up to six removable 50 ml plastic syringes. Located next to the turntable is a stationary ramp. As the turntable rotates, the syringe plunger is fed into the ramp which is designed to pull the plunger completely out within one hour at a constant speed. Thus, up to six one-hour integrated samples can be collected sequentially and automatically by such an instrument. Thorough testing of the samplers under extreme temperature conditions ( $-10$  to  $50^\circ\text{C}$ ) has proven that a six-hour cycle is always completed within  $\pm 1$  minute of the correct period.

A valve is installed in the center of the turntable to seal off all of the syringe sampling openings from ambient air except for the one which is in the sampling mode.

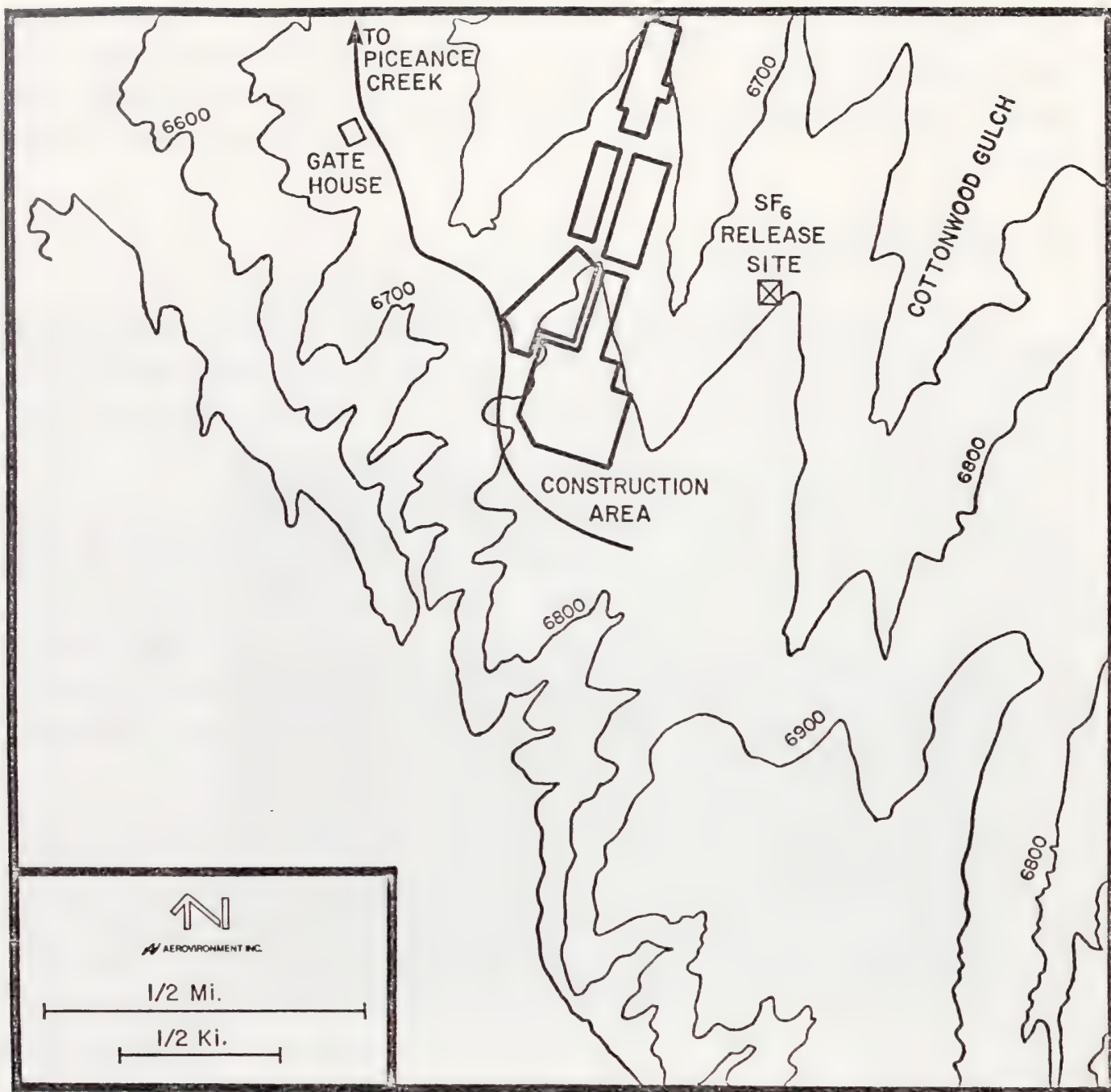


FIGURE 2-4. SF<sub>6</sub> release location in comparison to the site of the proposed ancillary facility.



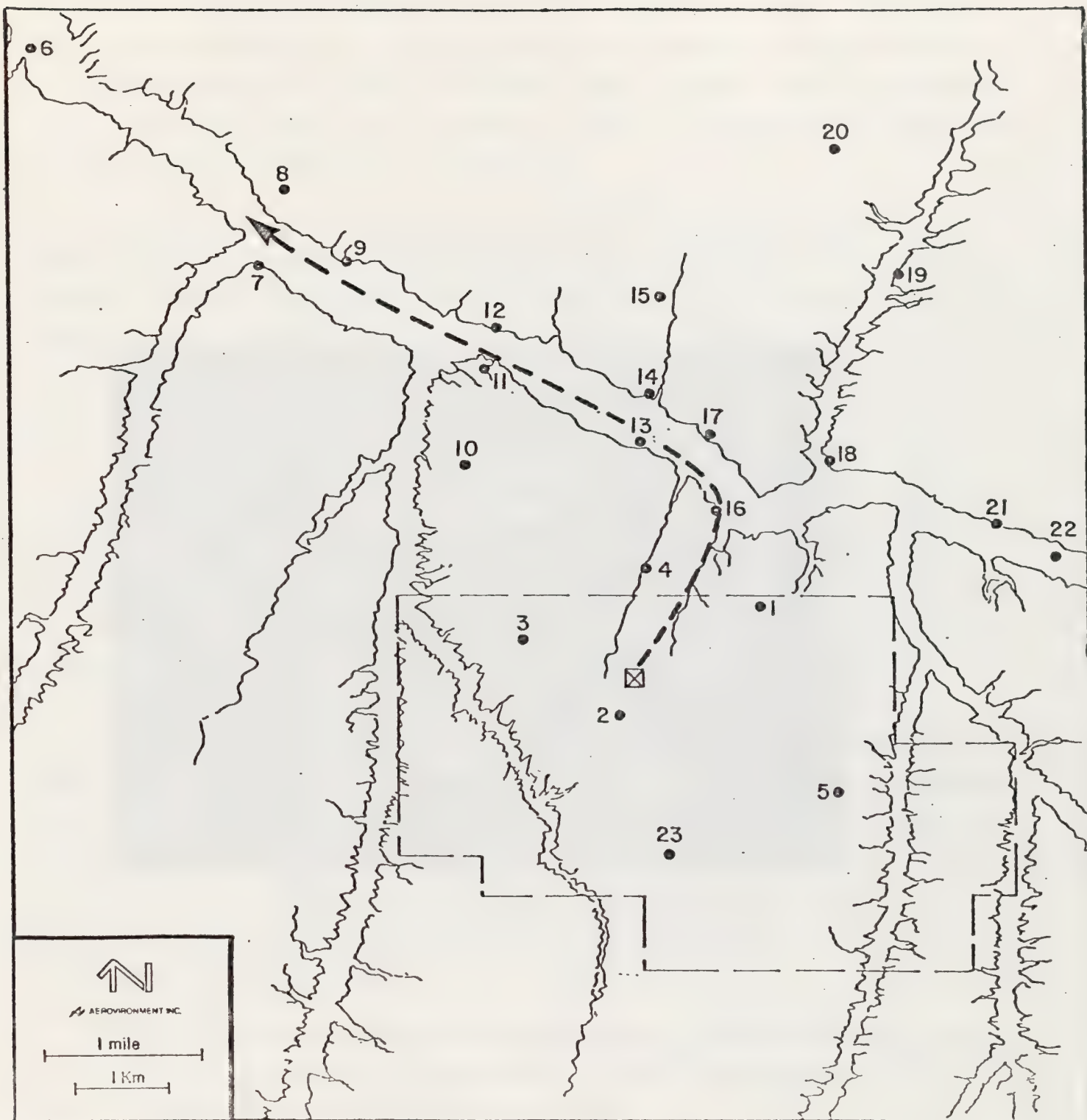


FIGURE 2-5. Locations of fixed sampler locations, SF<sub>6</sub> release site, and the expected plume trajectory in the early morning hours.

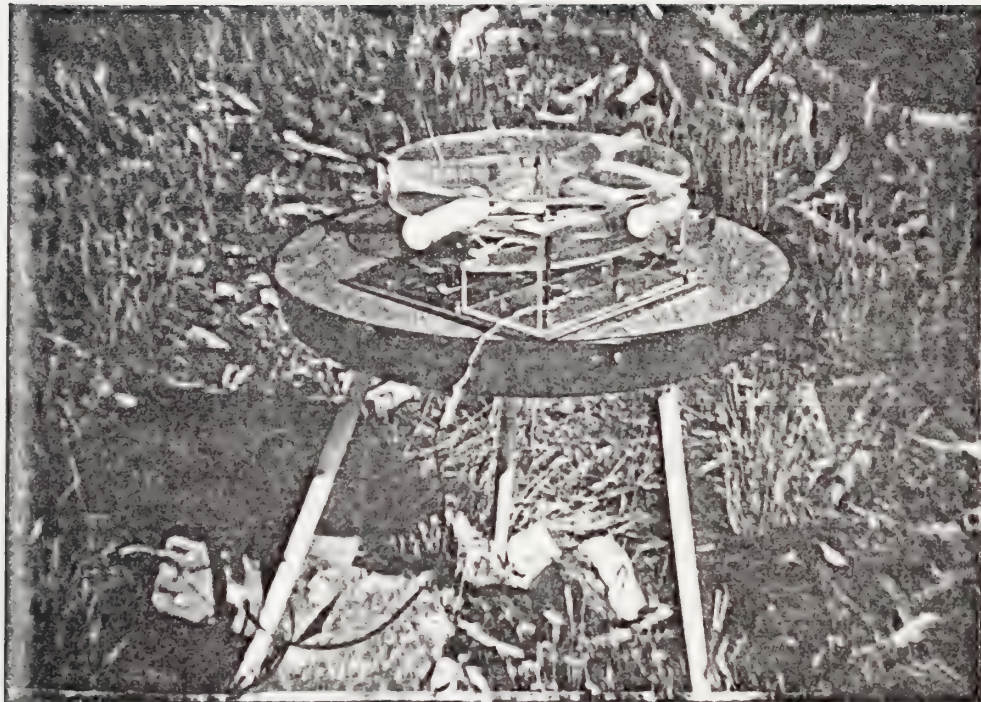


FIGURE 2-6. AV automatic sequential syringe sampler at work. One of the syringes has finished sampling, as indicated by the extended plunger, while another is in the sampling mode, as indicated by the plunger riding on the stationary ramp.

This design ensures that no diffusion would occur between the contents of the inactive syringes and the ambient air. At the end of a collection period, the syringes are removed manually and individually capped with specially designed plastic caps. Tests conducted prior to the actual experiment have shown that there is no measurable change in the contents of capped syringes within a 48-hour period.

At the random locations, grab samples were taken with plastic syringes. Figure 2-7 shows the collection of a grab sample during the experiment. The process consists of pulling out the syringe plunger very slowly. When the plunger is completely extended the syringe is sealed with a plastic cap. This process takes approximately 15 to 30 seconds.

### 2.3 Tracer Gas Analysis

The samples collected were analyzed for  $\text{SF}_6$  by means of a System, Science & Software ( $\text{S}^3$ ) Model 215 BGC Tracer Gas Monitor (Figure 2-8), an electron-capture gas chromatograph which was located in a nearby farmhouse which served as a temporary analysis laboratory shown in the map located in the back pocket of this report. The electron-capture gas chromatograph utilizes the high electron affinity of  $\text{SF}_6$  with halogen group elements to provide a measurable signal.

Sulfur hexafluoride is not the only electron-capture gas to be contended with while making this measurement. Oxygen ( $\text{O}_2$ ) also acts as a capture gas and will completely mask the  $\text{SF}_6$  in its small concentration without a separation technique. Many halo-carbons such, as members of the Freon family, will also give an electron-capture signal. Thus, an analytical column is used to separate the  $\text{SF}_6$  from other electron capturing components and to slow down the  $\text{O}_2$  molecules so that the  $\text{SF}_6$  can pass through the detector ahead of the  $\text{O}_2$ .

The  $\text{S}^3$  electron-capture gas chromatograph has a lower detectable limit of  $1 \times 10^{-12}$  parts concentration of  $\text{SF}_6$  per part of air (ppt), is linear between  $10^{-12}$  to  $10^{-9}$ , and has a repeatability of better than or equal to 3%.

To insure the accuracy of the data, the instrument is calibrated using samples of known  $\text{SF}_6$  concentrations ranging from  $10^{-9}$  to  $10^{-12}$  before, during, and after each analysis period.



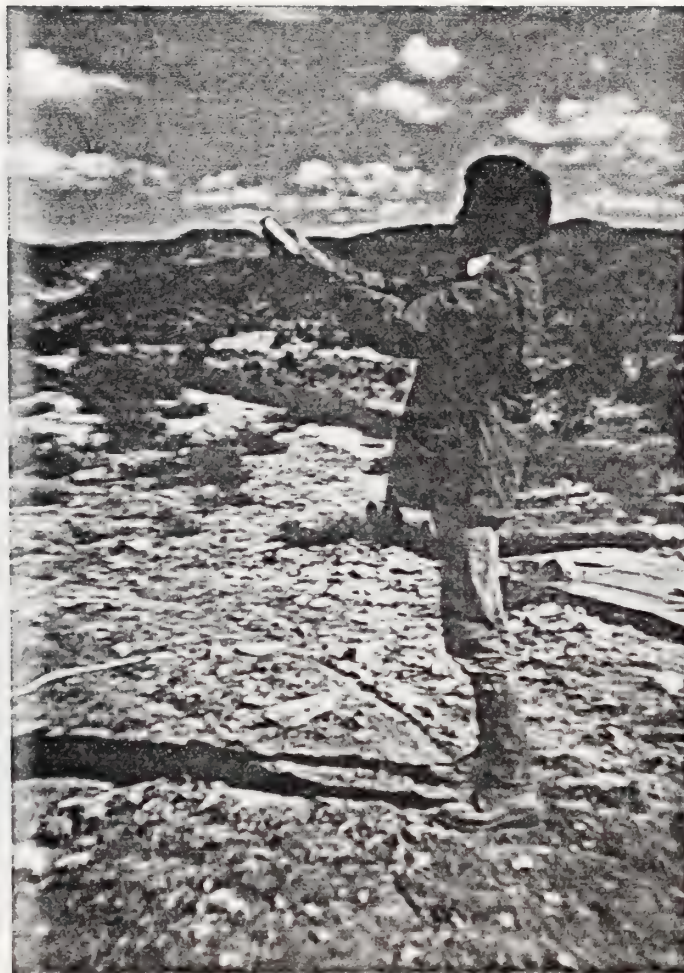


FIGURE 2-7. Collection of a grab sample.

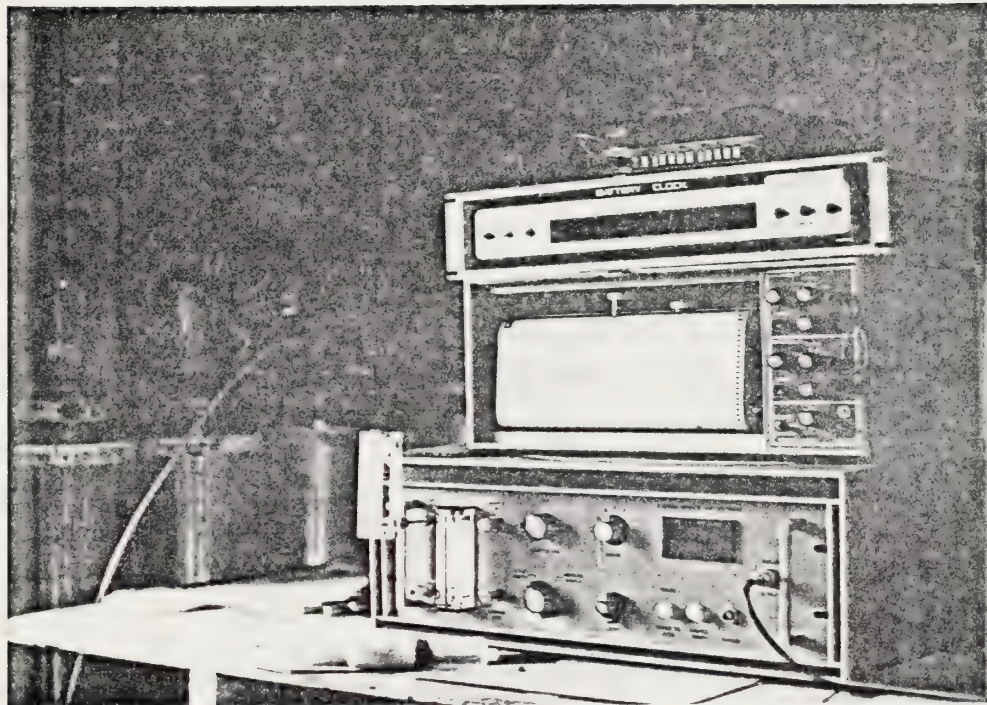


FIGURE 2-8. Systems, Science and Software Model 215 BGC tracer gas monitor.

## 2.4 Meteorological Measurements

A very important part of a model validation experiment is to characterize the meteorological conditions that transport and diffuse the tracer gas that is released. To achieve this, a network of meteorological equipment was set up on the tract. Surface wind speed and wind direction were measured continuously at eight locations, primarily along the expected plume trajectory. Temperature was also measured at seven of these sites. Their locations, as well as locations of other meteorological equipment are shown in Figure 2-9, as well as on the map in the back of this report.

In addition to measuring wind and temperature data at the surface (10 m above ground), wind speed and wind direction were measured at 30 m and 60 m at Site 023. Also measured at this site were turbulence information - the standard deviations of wind vane fluctuations and the standard deviations of vertical wind speed fluctuations ( $\sigma_{\theta}$  and  $\sigma_w$ ) at 10 m and the difference in temperature ( $\Delta T$ ) between 10 m and 60 m.

Vertical soundings of wind speed, wind direction, and temperature from ground surface to about 600 m above ground level were conducted hourly at Site 048, located in the Piceance Creek northwest of the release point. These soundings were made using a tethersonde system which includes an airborne sensor package, a balloon, an electric winch with line, and a ground receiving station. Figure 2-10 shows the tethersonde system at work.

Table 2-1 summarizes the meteorological measurements taken during the experiment. The range and accuracy of these instruments are presented in Table 2-2.

## 2.5 The Protocol

The experiment was performed on 14 and 15 September 1978 without any significant deviation from the original protocol (AeroVironment, 1978). The schedule of daily activities from the protocol is presented in Table 2-3.

On each of the two days, the experiment was begun at 0400 MDT, at which time  $SF_6$  was released at 100 m above the top of the rise to the east of the proposed ancillary



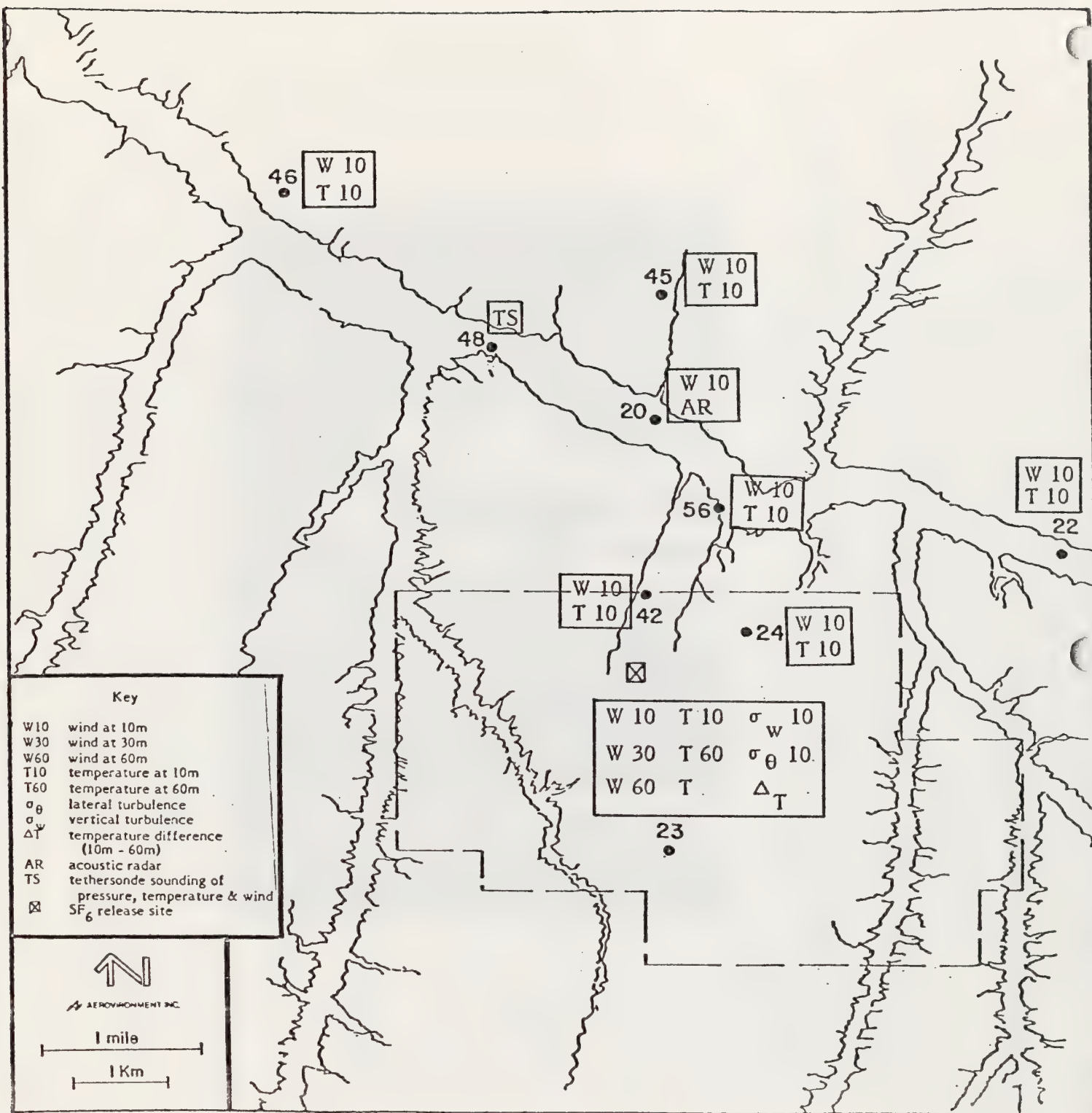


FIGURE 2-9. Locations of meteorological measurements.



FIGURE 2-10. The tethersonde sounding system at work. Temperature, wind speed, wind direction, and pressure were measured between ground and 1 km above ground level.

TABLE 2-1. Summary of meteorological measurements.

Site No.	Parameter	Equipment	Frequency
020	WS, WD Mixing height	WeatherMeasure W1034 AV Model 300A Acoustic Radar	continuous continuous
022	WS, WD, T	MRI 1071*	continuous
023	WS, WD (10m, 30m, and 60m) $\sigma_\theta$ (10m) $\sigma_w$ (10m) T (10m, 60m) $\Delta T$ (10m - 60m)	MRI 1074.2 MRI 1074.2 R. M. Young 27101 MRI 840 MRI 840	continuous continuous continuous continuous continuous
024	WS, WD, T	MRI 1022*	continuous
042	WS, WD, T	MRI 1071	continuous
045	WS, WD, T	MRI 1071*	continuous
046	WS, WD, T	MRI 1071*	continuous
048	T, Tw, WS, WD, P	Tethersonde TS-2A*	two soundings per hour
056	WS, WD, T	MRI 1071	continuous

\*equipment specifically installed for tracer study.



TABLE 2-2. The range and accuracy of meteorological instruments used in the experiment.

Instrument	Parameters Measured	Range	Accuracy
WeatherMeasure W1034 wind system	wind direction wind speed	0 to 540° 0 to 45 m/s	$\pm 5^\circ$ $\pm 0.5$ m/s
MRI 1071 mechanical weather station	wind direction wind speed temperature	0 to 360° 0.5 to 55 mph -34 to 49 C	$\pm 5^\circ$ $\pm 1$ m/s $\pm 1.5$ C
MRI 1074.2 wind system	wind direction wind speed	0 to 540° 0 to 45 m/s	$\pm 5^\circ$ $\pm 0.2$ m/s
MRI 1022 wind system	wind direction wind speed	0 to 540° 0 to 45 m/s	$\pm 3^\circ$ $\pm 0.2$ m/s
AV Sigma ( $\sigma_w$ ) computer	r.m.s. vertical wind fluctuation	0 to 1 m/s	$\pm 0.05$ m/s
MRI 840 temperature sensor	temperature	-50 C to 50 C	$\pm 0.10$ C
AV 300A Acoustic Radar	mixing height	20 m to 1000 m	$\pm 20$ m
Atmospheric Instrumentation Research Tethersonde	wind direction wind speed temperature pressure	0 to 360° 0.5 to 20 m/s -50 to 50 C 0 to 100 millibar	$\pm 5^\circ$ $\pm 0.25$ m/s $\pm 0.5$ C $\pm 1$ millibar

TABLE 2-3. Schedule of daily activities on 14 and 15 September 1978.

Time	Activity
0400 MDT	Begin SF <sub>6</sub> release from a kytoon 100 m above ground. Field technicians deployed to the predetermined sampling points to set up samplers.
0500	Tethersonde sounding.
0600	Beginning of first one-hour air sample collection. Tethersonde sounding.
0700	Beginning of second one-hour air sample collection. Tethersonde sounding.
0800	Beginning of third one-hour air sample collection. Tethersonde sounding.
0900	Beginning of fourth one-hour air sample collection. Tethersonde sounding.
1000	Beginning of fifth one-hour air sample collection. Tethersonde sounding.
1100	End of air sample collection. Tethersonde sounding. SF <sub>6</sub> release shut off. Field technicians collect samplers, take them to field office, remove syringes and install new syringes.
1200	Sample syringes taken to nearby farmhouse.
1300	Beginning of SF <sub>6</sub> analyses of samples.

facility. The release was continued through 1100 MDT at a constant rate of approximately 3 g/s (28 lb/hr).

Ambient air sampling was commenced at 0600 by use of automatic sequential syringe samplers at 23 fixed locations. Sampling was not begun until two hours after the release was under way, assuring that a quasi-steady state had been attained. Five consecutive one-hour integrated air samples were collected at these locations through 1100 MDT. These locations were shown earlier in Figure 2-5.

In addition to collecting samples at these fixed locations, 61 grab samples were taken at locations shown in Figure 2-11 on 14 September, and 67 grab samples were taken at locations shown in Figure 2-12 on 15 September.

During the test period, meteorological measurements discussed in Section 2.4 were activated. Measurements included wind speed, wind direction, temperature, temperature difference between 10 m to 60 m, turbulence, mixing height, and vertical profiles of temperature, wind speed, wind direction, and pressure.

At the end of each test day, air samples were taken to the nearby farmhouse about two miles northwest of the tract and were analyzed for  $\text{SF}_6$  by use of an electron capture gas chromatograph.



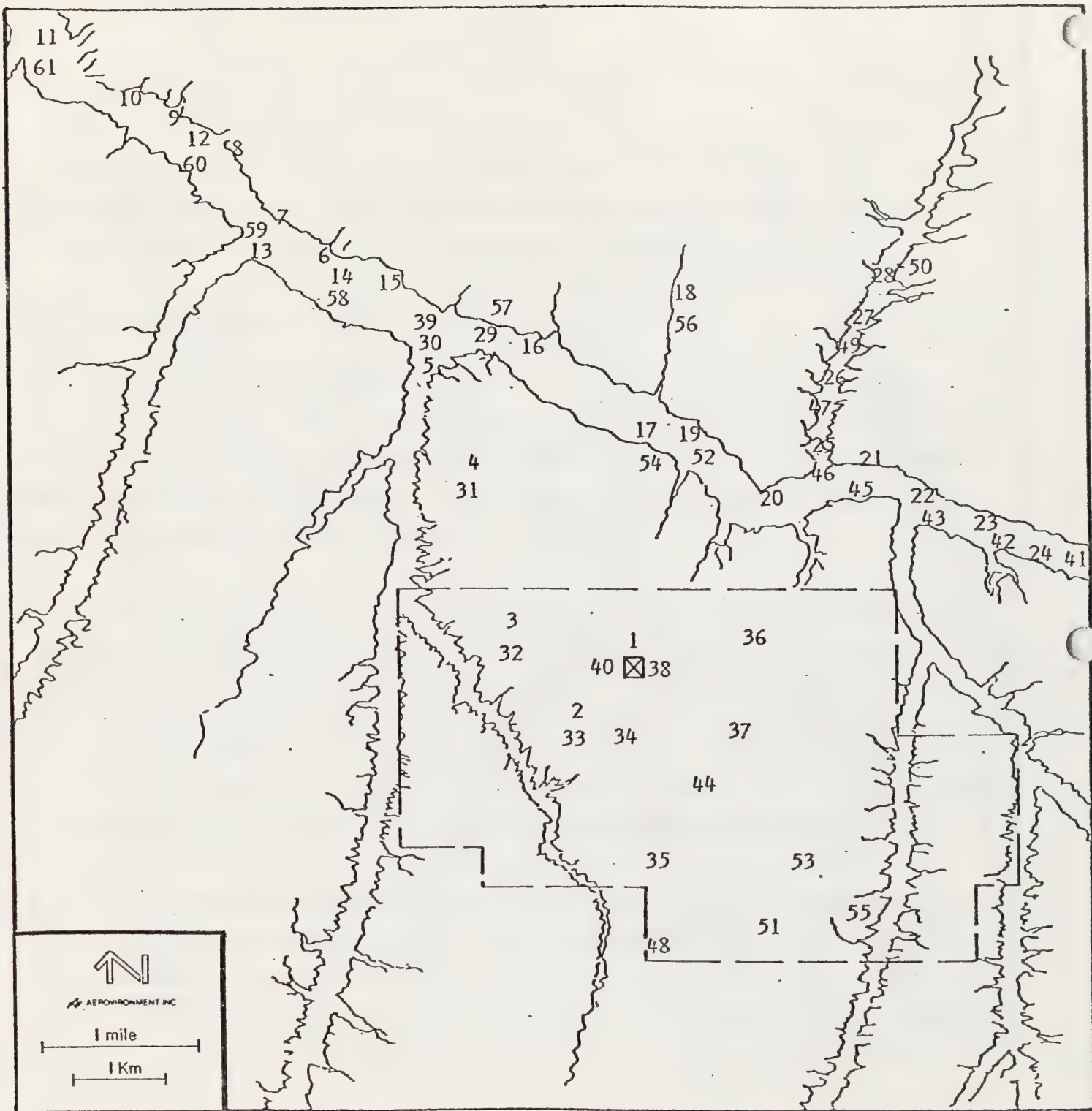


FIGURE 2-11. Locations of grab samples taken on 14 September 1978.

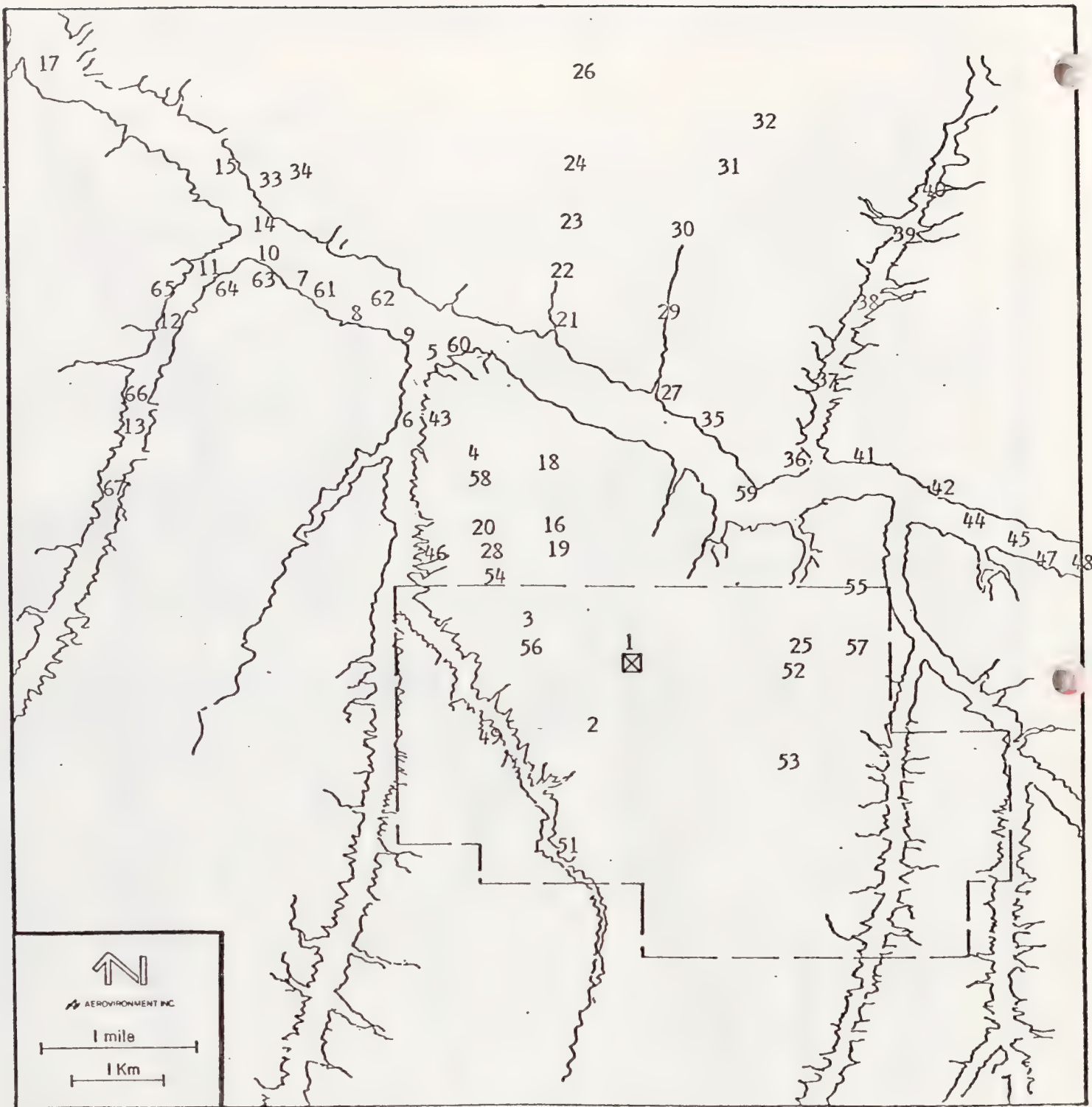


FIGURE 2-12. Locations of grab samples taken on 15 September 1978.

### 3. RESULTS

To understand the distribution of tracer gas concentrations, one has to first understand the factors affecting such a distribution - namely, the meteorological conditions that existed during and immediately preceding the release of tracer gas. Section 3.1 discusses the synoptic weather situation on the days of the experiment. Section 3.2 presents the meteorological conditions observed over the tracts during the experiment while Sections 3.3 and 3.4 present the tracer gas data.

#### 3.1 Synoptic Weather Situation

After a frontal passage on September 11, a closed upper-level low formed north of Tract C-b. By the morning of September 14, a general northeast-southwest trough situation had developed from Manitoba to Nevada (see Figure 3-1). Two distinct low pressure centers were centered in these areas with Colorado in between. Pressure gradients became weak over the tract.

After sunrise on the 14th, an anomalous blocking pattern with a warm high over Western Canada formed. By the morning of the 15th (Figure 3-2) a fast west-east jet stream had set up along the U.S.-Canadian border. At the surface a rapidly moving, weak, dry front passed mainly south of the tract during the afternoon and early evening of the 14th. Clouds from this system cleared away shortly after midnight but the pressure maintained its weak pattern. By the afternoon of the 15th, clouds and a strong southwest flow preceding another weather front were becoming established over the tract area.

The weak pressure gradients and the lack of clouds allowed the formation of strong drainage, particularly along Piceance Creek, on the morning of September 14. Although clouds formed during the afternoon of September 14, they cleared away shortly after midnight, allowing radiative cooling of the ground to take place. The drainage that developed on the morning of September 15, however, was much weaker than that of the 14th.



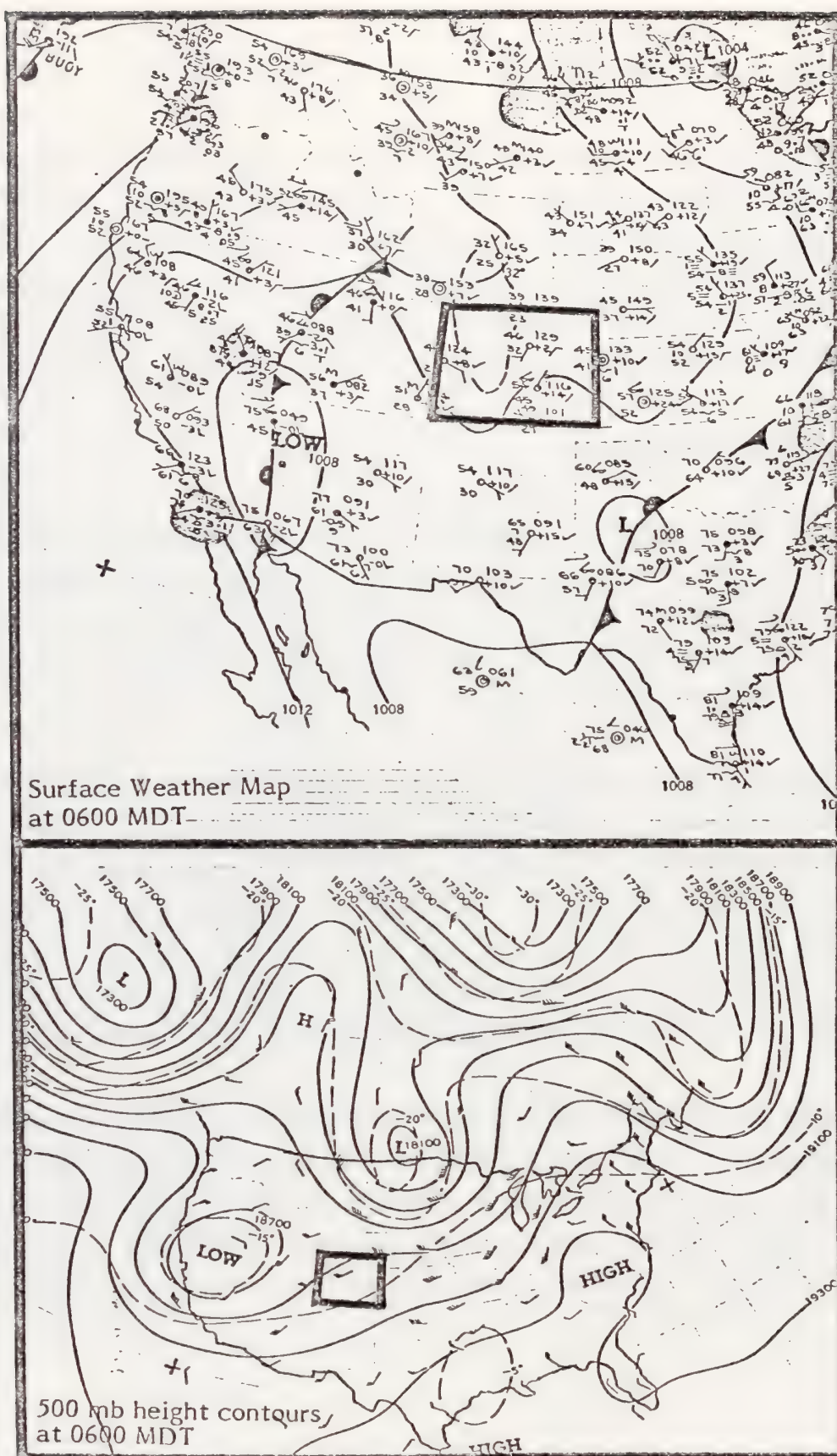


FIGURE 3-1. Synoptic weather situation on 14 September 1978.

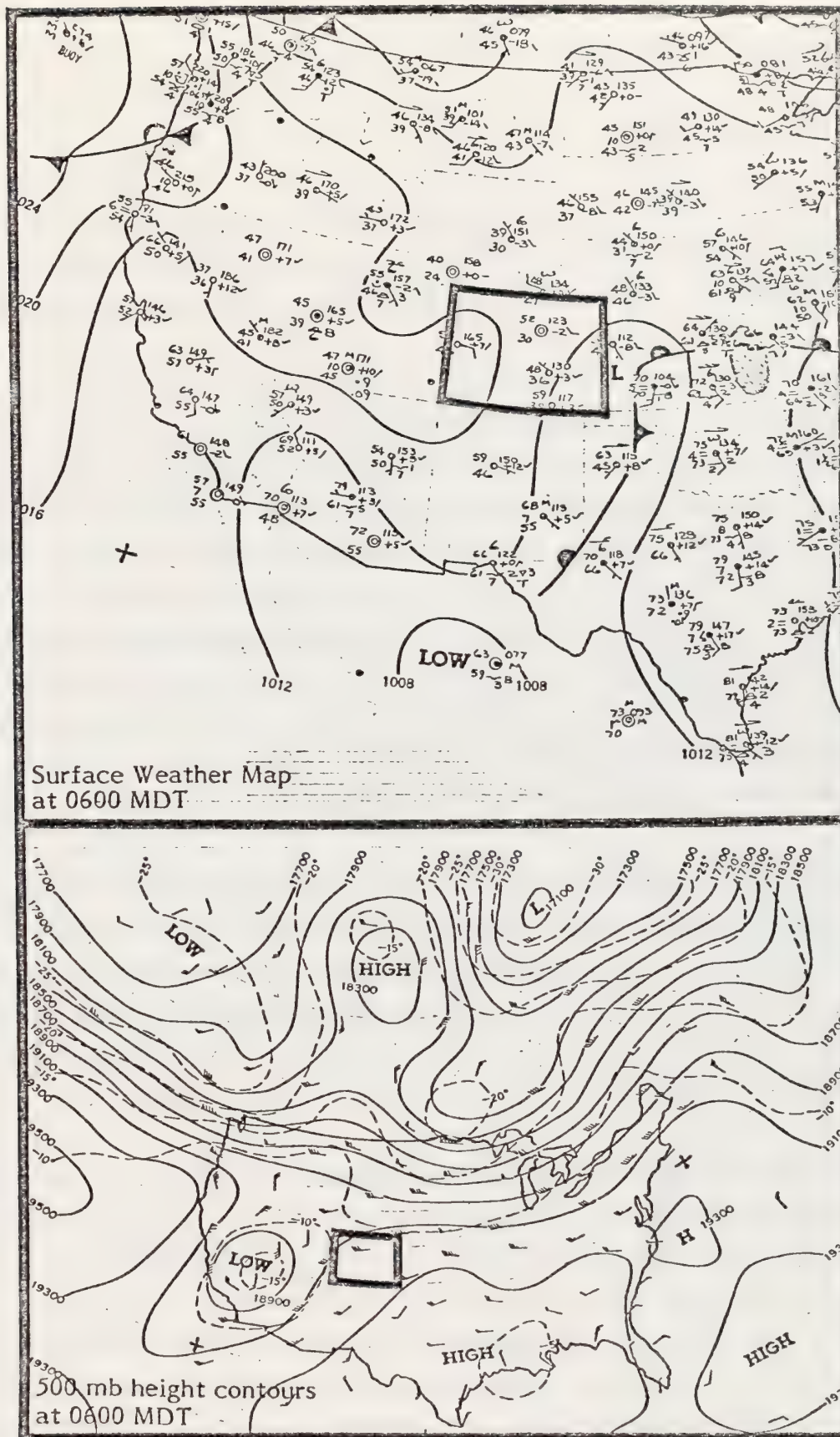


FIGURE 3-2. Synoptic weather situation on 15 September 1978.



### 3.2 Meteorological Conditions on C-b Tract

#### o 14 September 1978

The atmospheric structure over Piceance Creek as well as over the entire tract is best illustrated by soundings taken at Site 048. Data collected during the soundings are presented in Appendix A. Figure 3-3 shows three such soundings of temperature.

As a result of strong radiative cooling, a very deep surface-based inversion appeared in the pre-dawn hours. This inversion was quite strong close to the surface but gradually weakened until about 500 m AGL, when it became isothermal. This situation was observed in soundings through 0700 MDT. Beginning at about 0800 MDT, the inversion lost more of its strength and the base of the isothermal layer lowered to about 350 m AGL. The destruction of the surface-based inversion began at about 0900 MDT and the top of the isothermal layer was detected at about 450 m AGL. This isothermal layer was topped by a neutral lapse layer. Further destruction of the surface-based inversion and lowering of the base of the neutral lapse layer continued until about 1100 MDT, when the inversion totally disappeared and was replaced by a neutral lapse condition. Similar conclusions could be derived from data collected by the acoustic radar at Site 020.

This atmospheric structure would, of course, apply only along the Piceance Creek. However, one can infer that a surface-based inversion did exist over the entire tract, even on the ridges and above the release site. This inference is supported by the delta-temperature data collected at Site 023 as well as by tethersonde profiles taken over the tract at various locations in 1976 (C-b Shale Oil Venture, 1976). Figure 3-4 shows what the constant potential temperature surfaces should look like over the tract.

The soundings at Site 048 also provided valuable information concerning the wind flow above the Piceance Creek. Strong drainage was evident, with the maximum speed appearing shortly after 0600 MDT at about 150 m AGL. The synoptic flow pattern was not observed below about 600 m AGL in the early morning hours. As the morning advanced, the heat gained by the surface from solar radiation exceeded that lost by terrestrial radiation and the soil temperature rose, warming the air just above. This created pressure differences resulting in an upslope flow. The evidence of this upslope



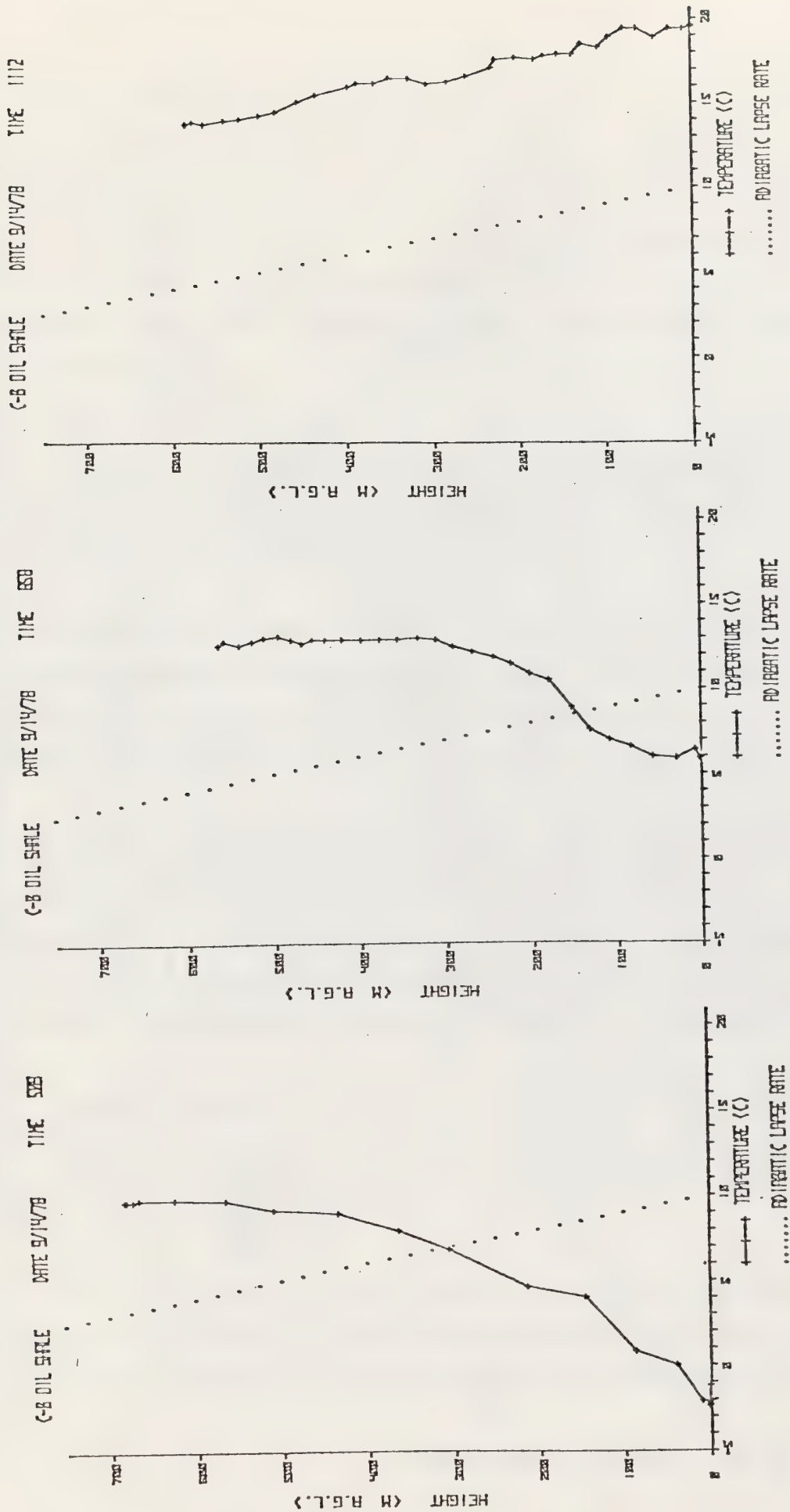


FIGURE 3-3. Temperature soundings taken on 14 September 1978.

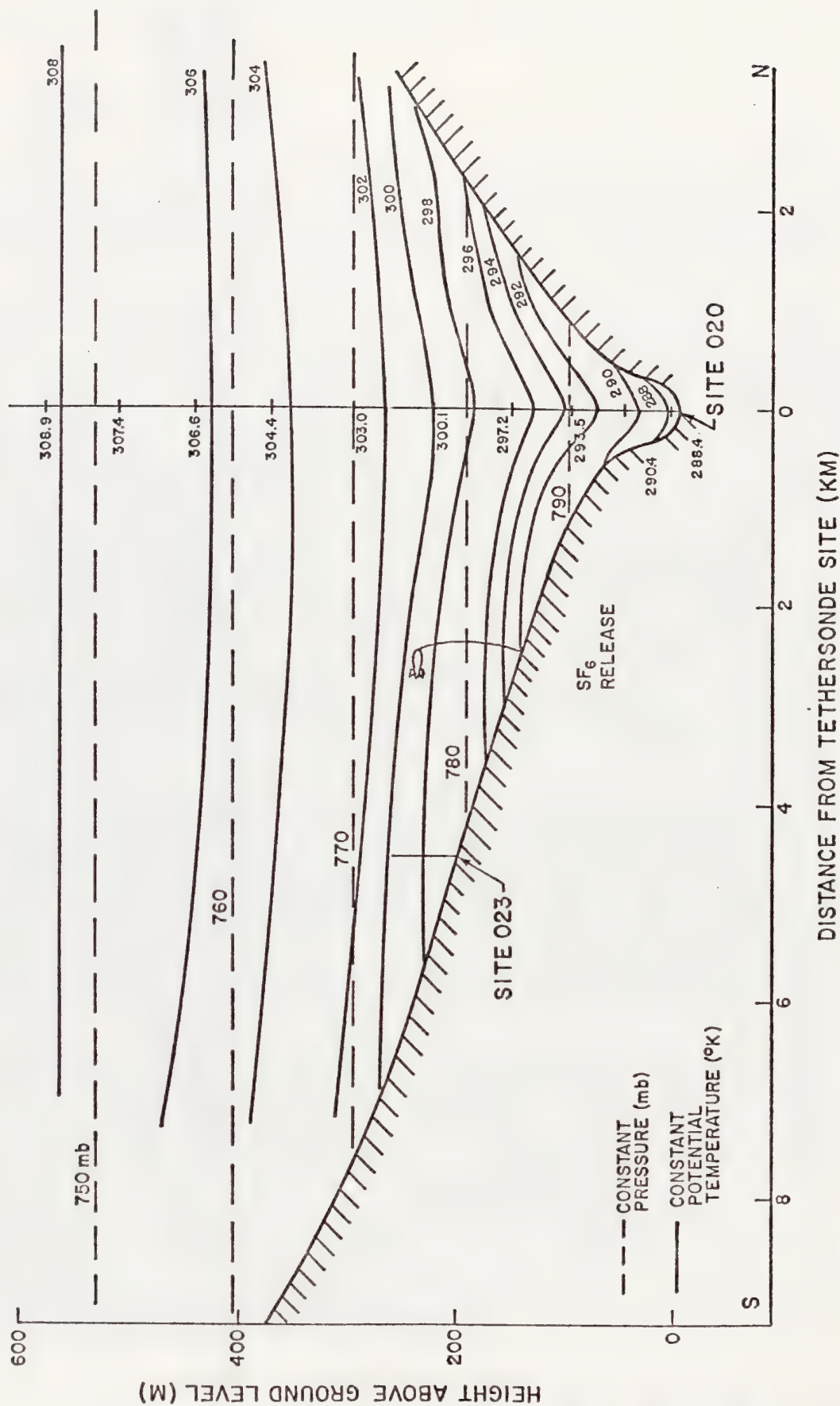


FIGURE 3-4. Constant potential temperature surfaces constructed from sounding taken at Site 048 on the morning of 14 September 1978.

flow showed up at about 0900 MDT. At this time there were still remnants of the nighttime drainage on top of this newly developed upslope flow. The strongest shear appeared at around 200 m AGL. It was not until the end of the experiment, around 1100 MDT, that the drainage flow system was totally destroyed. Even at 1100 MDT, there was still a surface layer of upslope flow to about 150 m, above which existed the synoptic flow. This wind flow picture is illustrated in Figure 3-5. It is interesting to note that at about 300 m AGL, the wind speed was virtually zero at 0600-0700 MDT, the first hour of the sampling period.

The wind flow over the rest of the tract (other than over Piceance Creek) followed a similar pattern. Strong drainage prevailed between 0400-0600 MDT. Figure 3-6 shows streamlines of the drainage situation while Figure 3-7 shows what the drainage looks like in a cross-section between Sites 023 and 020.

During the first hour of sampling, the overall pattern was still of the drainage type although almost calm conditions were detected at various locations over the tract. At the release site, the kytoon was observed to head towards the west, then rotated clockwise during the hour to finally end up pointing towards the south-southeast direction.

The second hour of sampling saw the head of the kytoon meandering between south-southeast to east. In other words, the wind at the level of release was from the south-southeast to east. Over other parts of the tract, the wind was light and often variable, with the predominant direction from the eastern sector. This is probably due to the fact that the tract is located west of the Continental Divide and in the macroscale, there would be a drainage that flows generally from east to west over the tract.

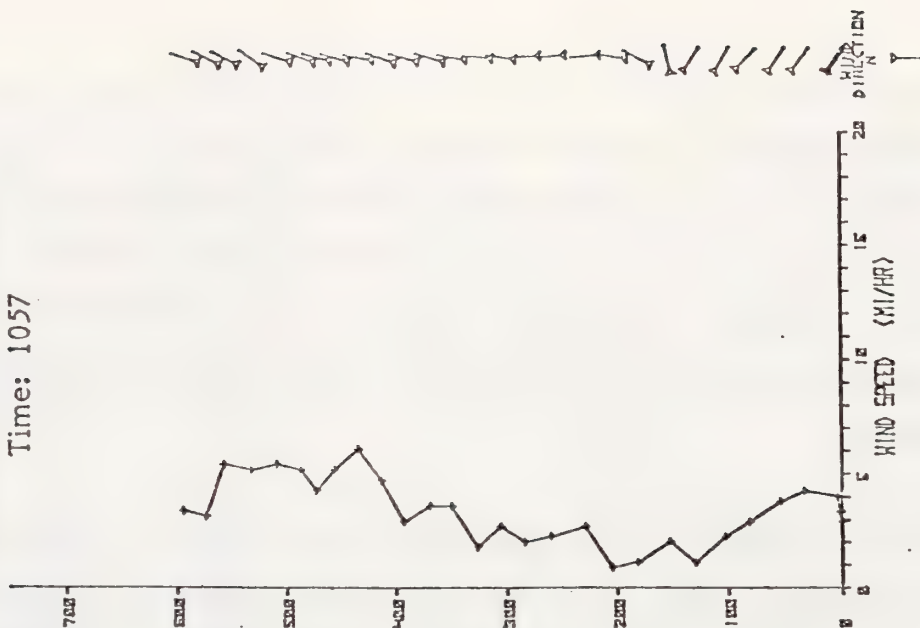
Between 0800-0900 MDT, the wind at the point of release, as indicated by the heading of the kytoon, was from the southeast to east. Meteorological data from other wind stations indicated that the wind was still light and variable, without a definitely organized flow system.

During the last two hours of the sampling period, the heading of the kytoon indicated that the wind at the point of release was from the north to east quadrant. Data collected also indicated that the wind was generally from the north in areas south of the



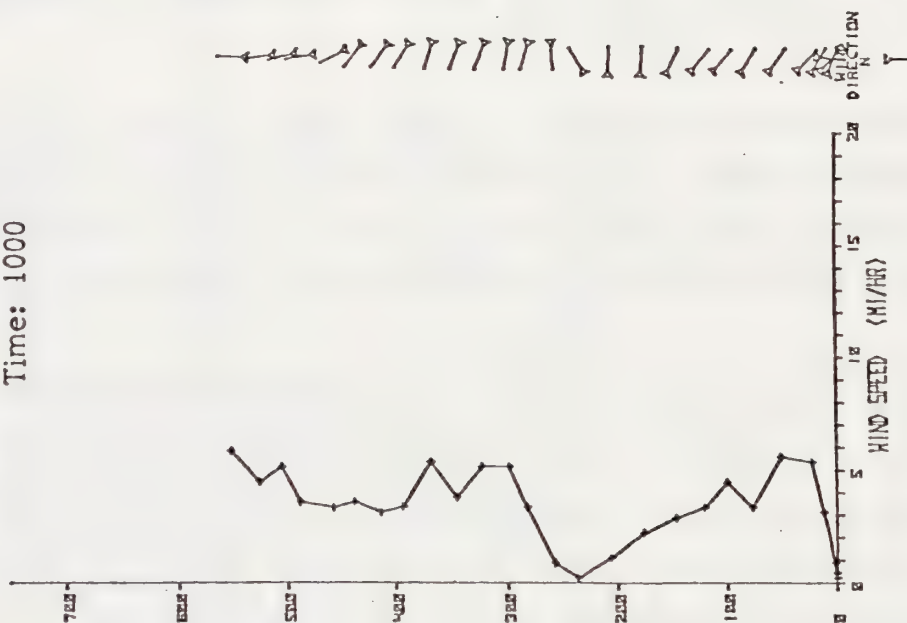
RECOVERIMENT INC. TETHERSONDE

Time: 1057



RECOVERIMENT INC. TETHERSONDE

Time: 1000



RECOVERIMENT INC. TETHERSONDE

Time: 0605

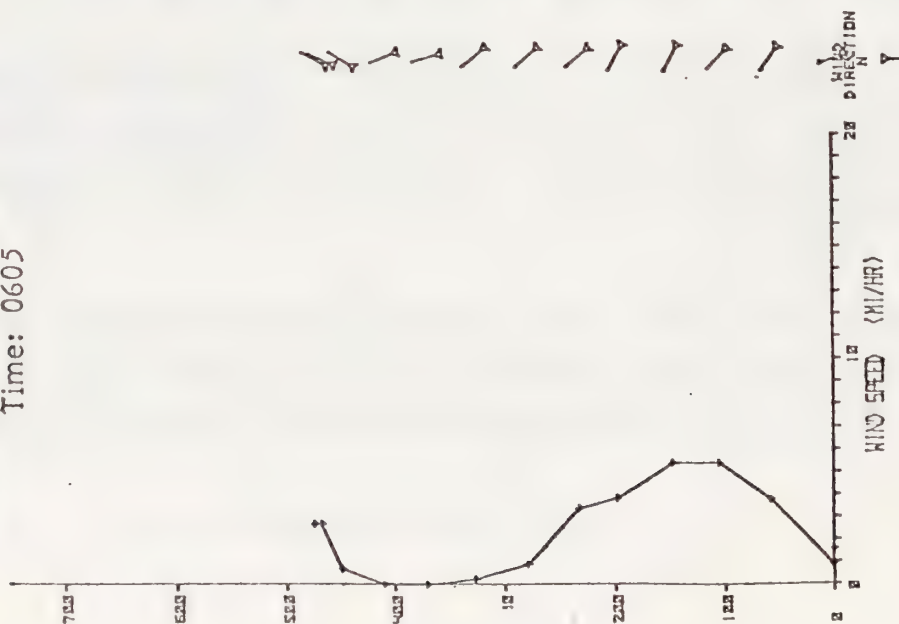


FIGURE 3-5. Wind soundings taken on 14 September 1978.



FREE AIR FLOW

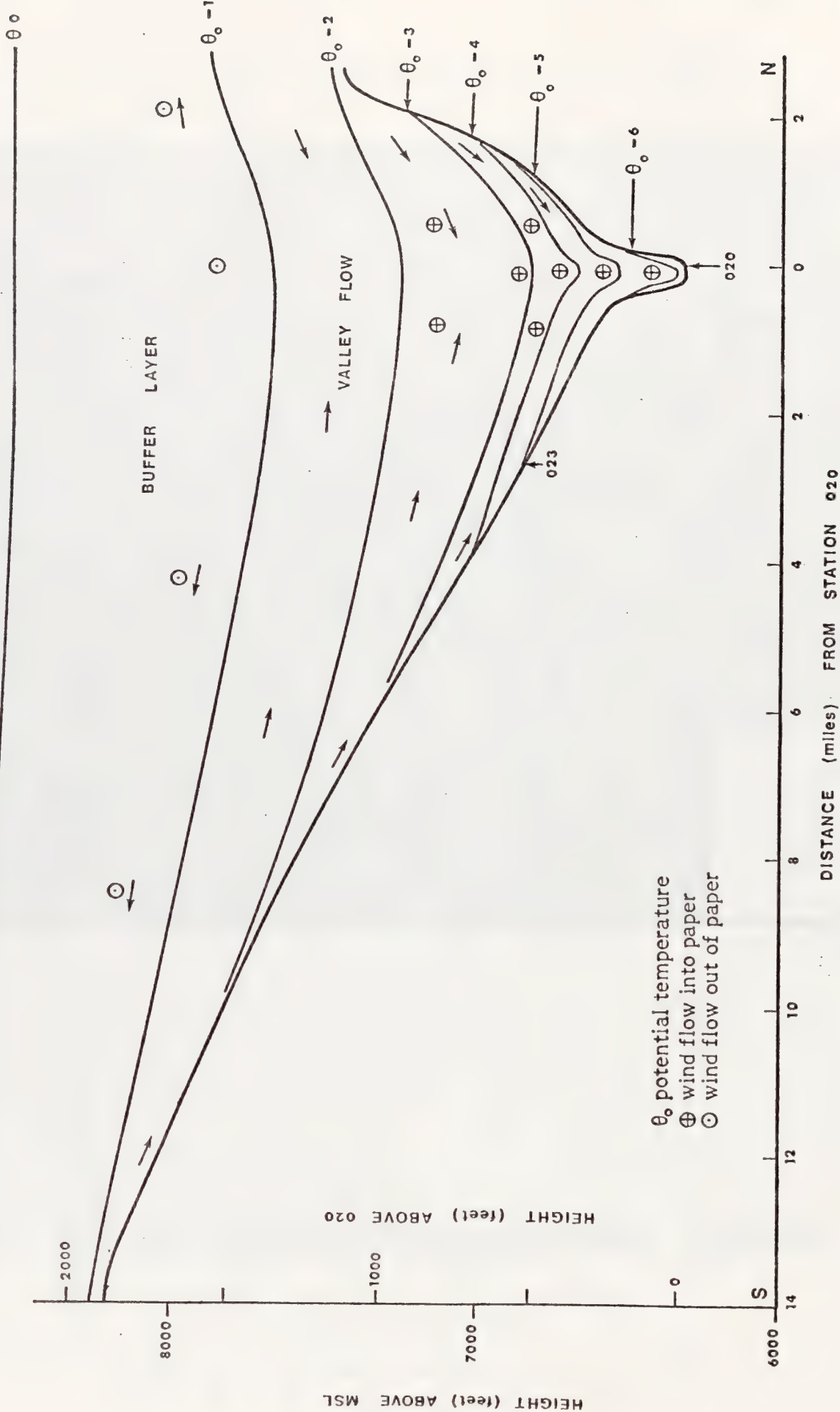


FIGURE 3-7. A cross-sectional view of the drainage flow.



Piceance Creek and from the south from areas north of the Piceance Creek. This phenomenon is generalized in Figure 3-8 and Figure 3-9.

The synoptic flow (winds from the south) was never established at the surface during the sampling period. It appeared around noon. Figure 3-10 shows a picture of the synoptic pattern in the afternoon.

Data collected at Site 023 showed that turbulence was weak throughout the period of sampling, especially between 0600-0800 MDT.

In summary, during the first three hours of sampling drainage was evident along Piceance Creek and the gulches leading to Piceance Creek. Over the ridges and higher ground, the surface flow was disorganized and weak. In the last two hours of sampling, an upslope flow was discernible all over the tract. Turbulence was weak, especially between 0600-0800 MDT.

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The temperature soundings taken during the early morning hours showed a surface-based radiation inversion. However, as discussed in Section 3.1, the weak front that passed over the tract in the previous afternoon and the clouds associated with the front resulted in an inversion that was shallower and weaker than the one during the previous morning. A neutral lapse rate existed above about 500 m AGL at 0600 MDT. The effect of surface heating was also detected an hour earlier than on 14 September. The destruction of the surface-based inversion was observed at 0800 MDT, at which time the base of the neutral-lapsed layer was at about 400 m AGL. By 0900 MDT, the entire layer above the ground had attained an adiabatic structure.

The changes in wind flow in the vertical related very well to the temperature structure. Within the inversion layer, a drainage condition existed. Above the inversion, the synoptic flow pattern was obvious. Immediately following the onset of surface heating, wind in the layer closest to the ground became weak. At 0900 MDT, the wind in the bottom 200 m was almost calm. Shortly thereafter, the wind speed began picking up and by 1100 MDT, the wind in the entire layer averaged about 5 m/s. There was no evidence of any upslope wind flow pattern.

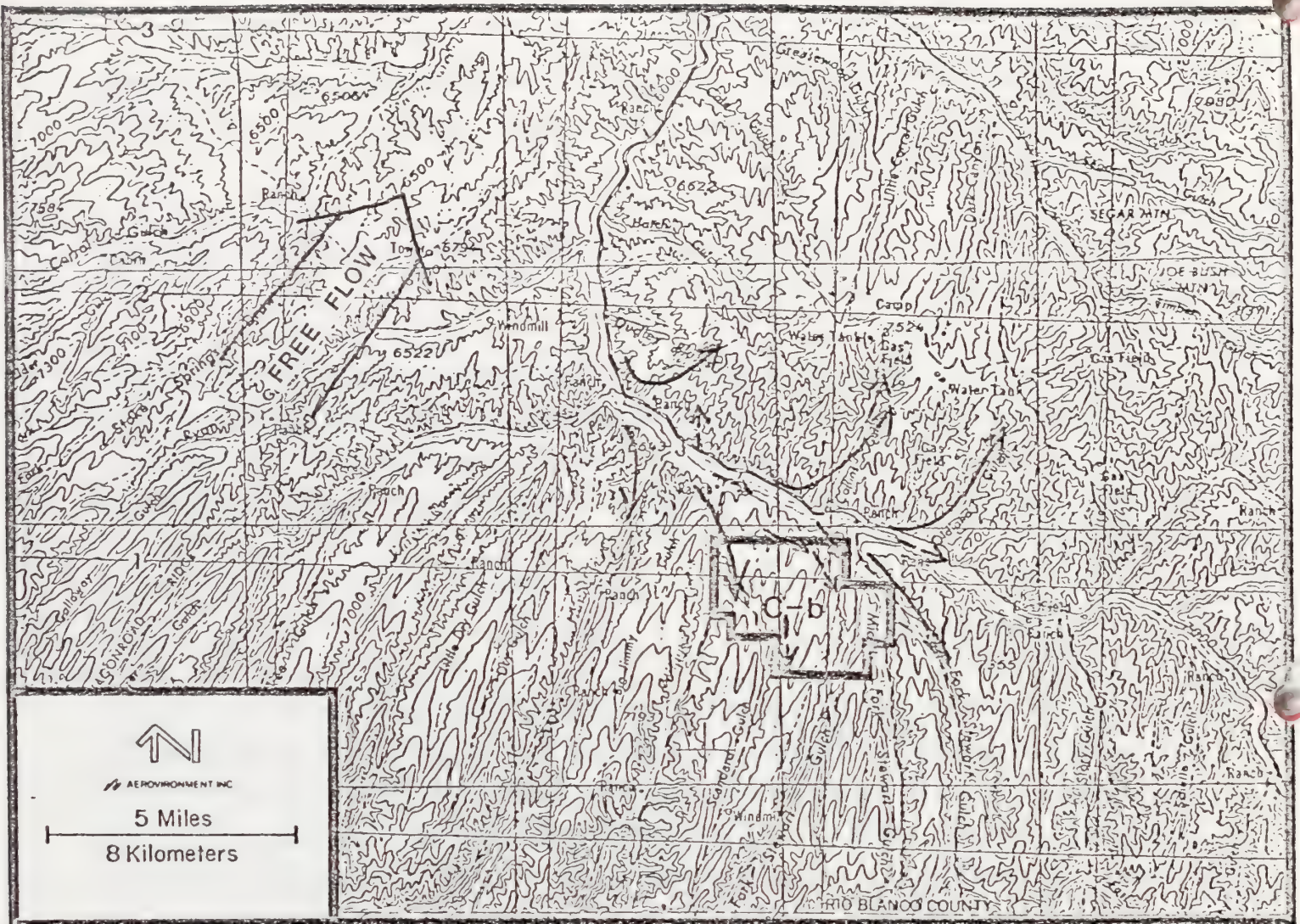


FIGURE 3-8. Streamlines of upslope flow over Tract C-b.



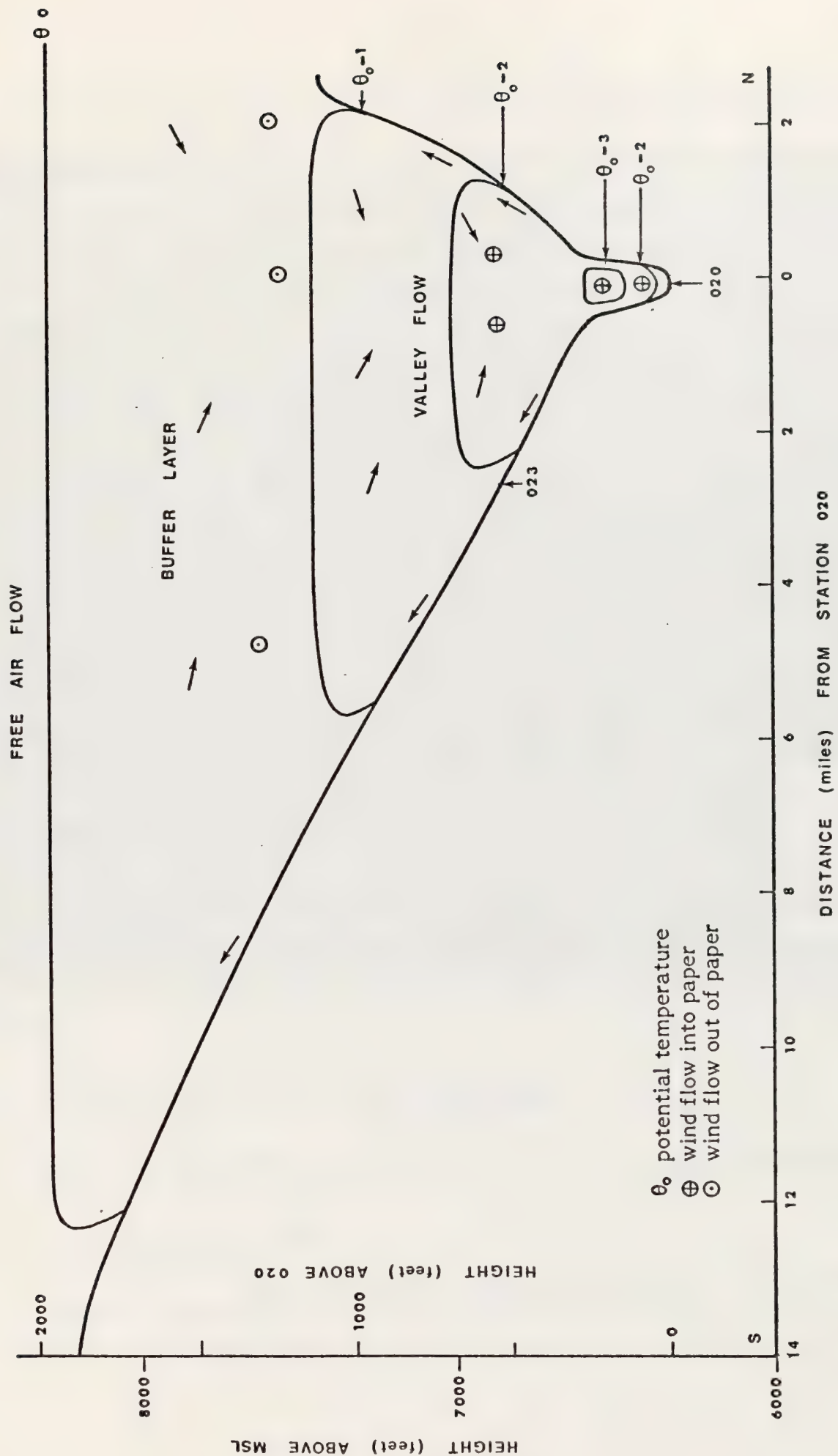


FIGURE 3-9. A cross-sectional view of the upslope flow.





Figures 3-11 and 3-12 show the progression of temperature and wind soundings respectively during the experiment.

At the release site, the orientation of the kytoon indicated that the wind was from the southeast to east sector starting at 0400 MDT through 0900 MDT. During the hour beginning at 0900 MDT, the kytoon indicated that the wind was mostly from the south to southwest sector with a short period with winds coming out of the northwest. The wind was from the southwest during the first half of the last hour of  $\text{SF}_6$  release and from the south-southwest during the second half of the last hour at the point of release.

Wind data at other sites showed that the wind was from the north to east quadrant on the ridges between 0600-0800 MDT and from the western quadrant between 0800-0900 MDT. Thereafter, all surface data, including wind observations in Piceance Creek, showed evidence of the synoptic wind flow pattern, generally from the south-southwest.

In summary, there was a drainage system over the tracts prior to 0800 MDT. Between 0800-0900 MDT, there was a transition from the drainage to synoptic flow and the synoptic flow took control after 0900 MDT. The wind, as well as turbulence, was stronger than the previous day, especially before 0800 MDT.

### 3.3 Tracer Gas Release Data

The actual release data is presented in Appendix B. The release rate was kept fairly constant during the experiment, at about 3.21 g/s (28.8 lb/hr) in the first day and 3.14 g/s (28.0 lb/hr) in the second day. The height of release was approximately 100 m (330 ft) AGL.

### 3.4 Distribution of Ground Level $\text{SF}_6$ Concentration

The actual observed  $\text{SF}_6$  concentrations at all sites are presented in Appendix C.

#### o 14 September 1978

Figures 3-13 through 3-17 show isopleths of  $\text{SF}_6$  constructed from observed data. Downwind of the plume there were several places without observations, which made

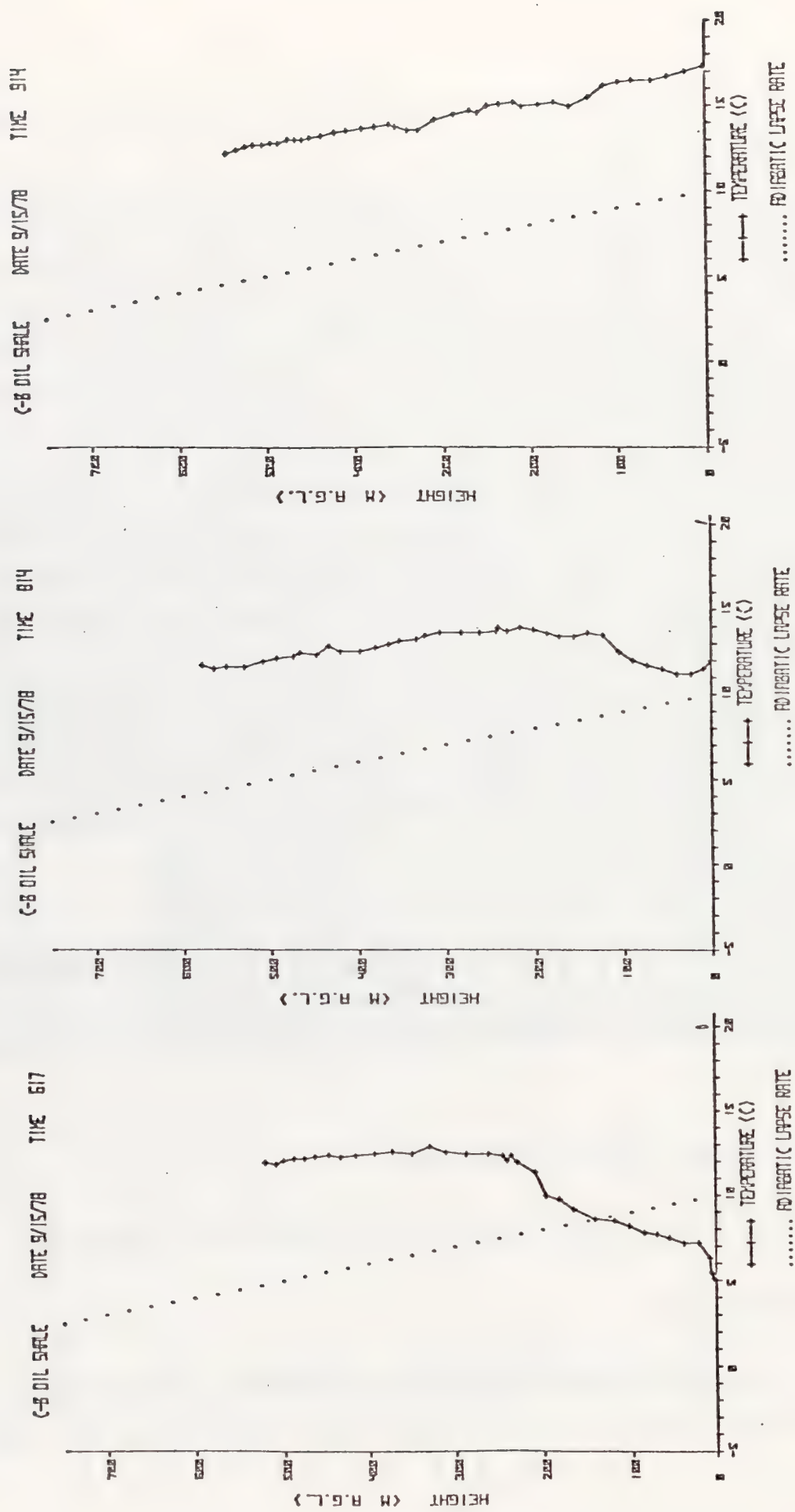
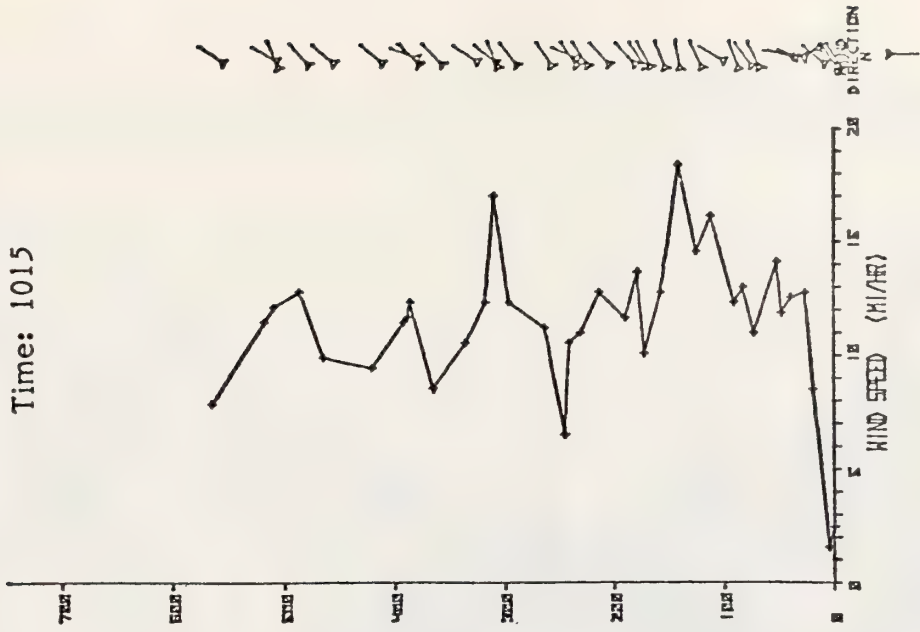


FIGURE 3-11. Temperature soundings taken on 15 September 1978.



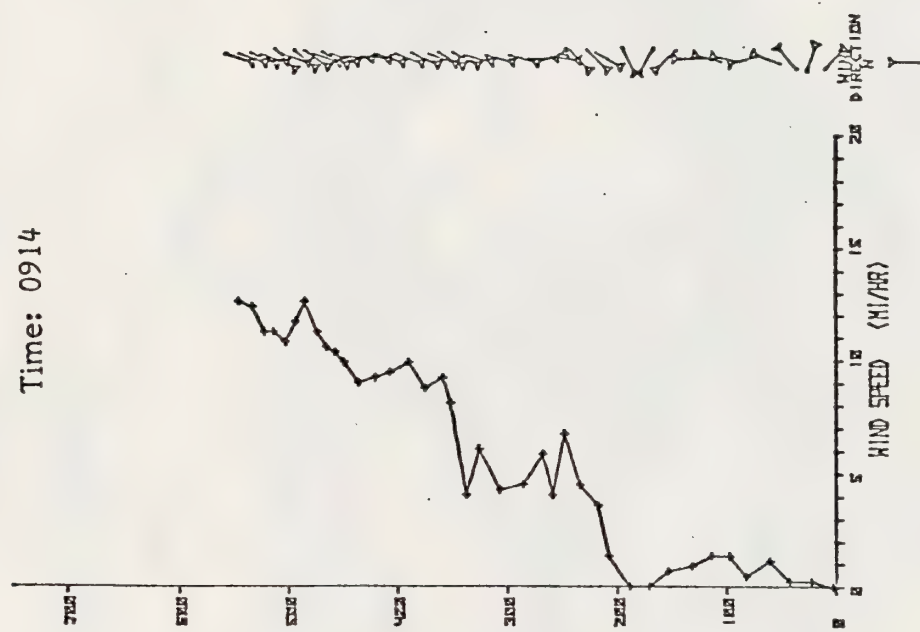
RECOVERY INC. TETHERSONDE

Time: 1015



RECOVERY INC. TETHERSONDE

Time: 0914



RECOVERY INC. TETHERSONDE

Time: 0617

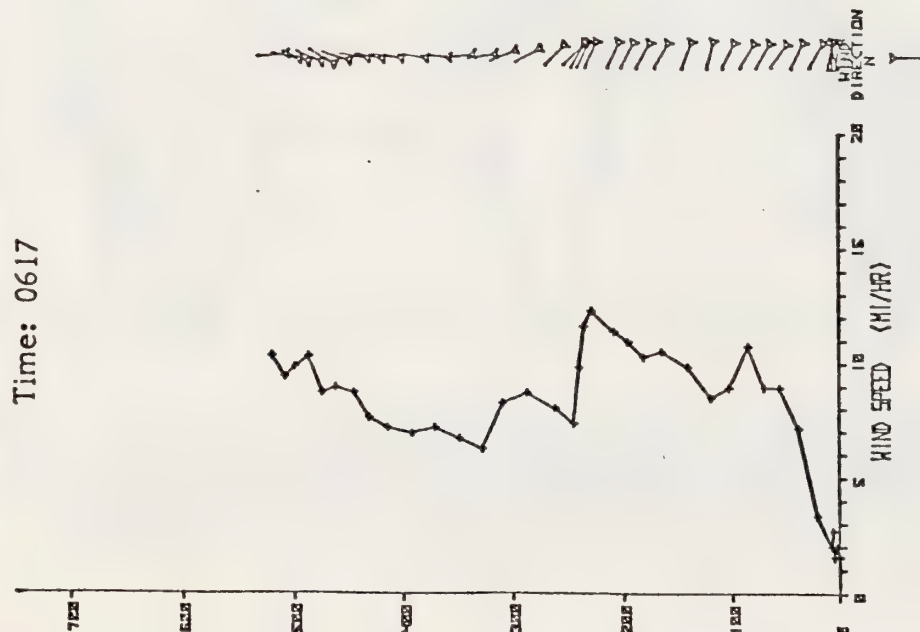


FIGURE 3-12. Wind soundings taken on 15 September 1978.

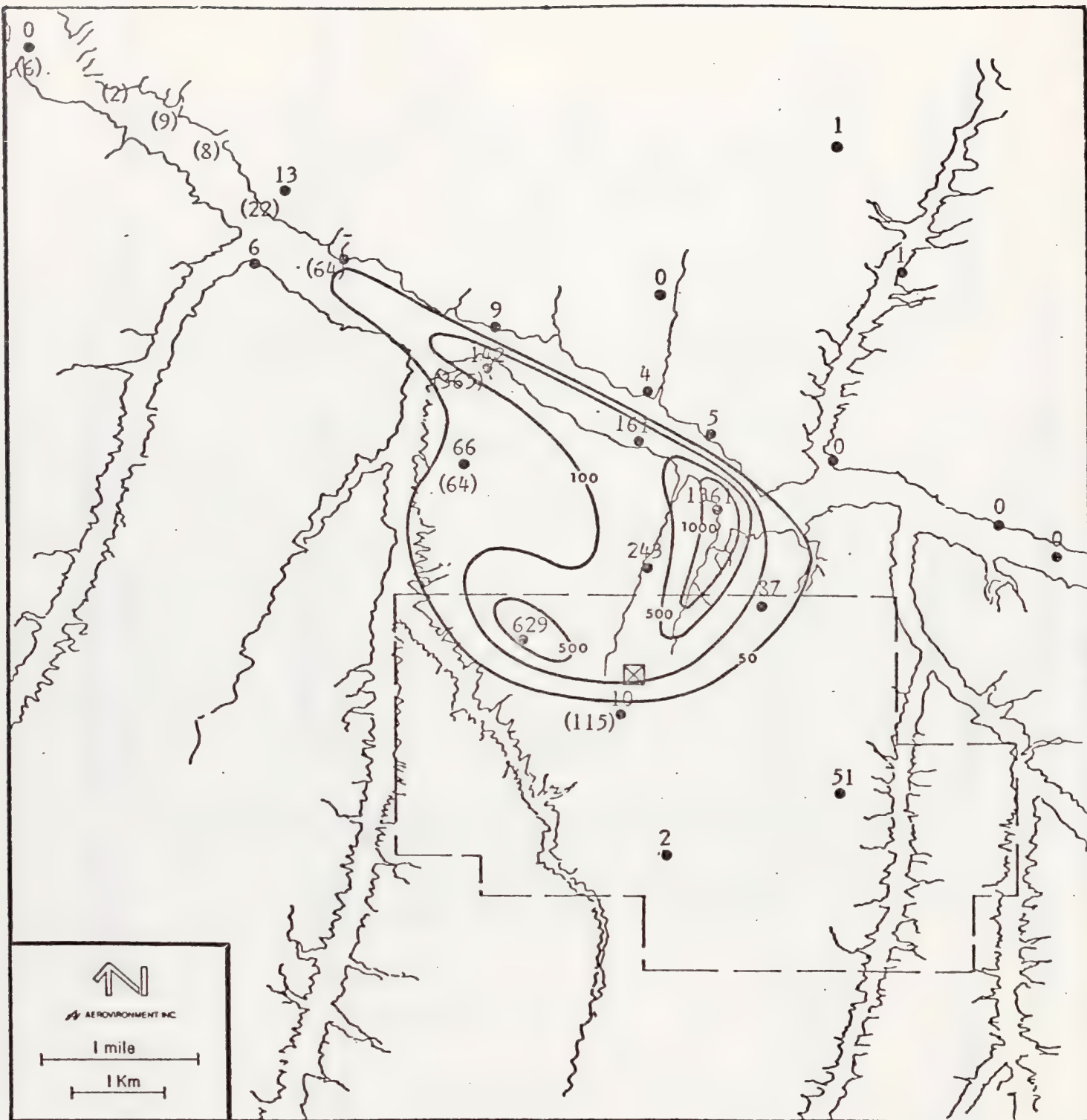


FIGURE 3-13. Isopleths of  $\text{SF}_6$  concentration for hour beginning 0600-0700 MDT on 14 September 1978. Numbers without brackets denote one-hour averaged  $\text{SF}_6$  concentrations (ppt), while numbers with brackets denote instantaneous  $\text{SF}_6$  concentrations (ppt).

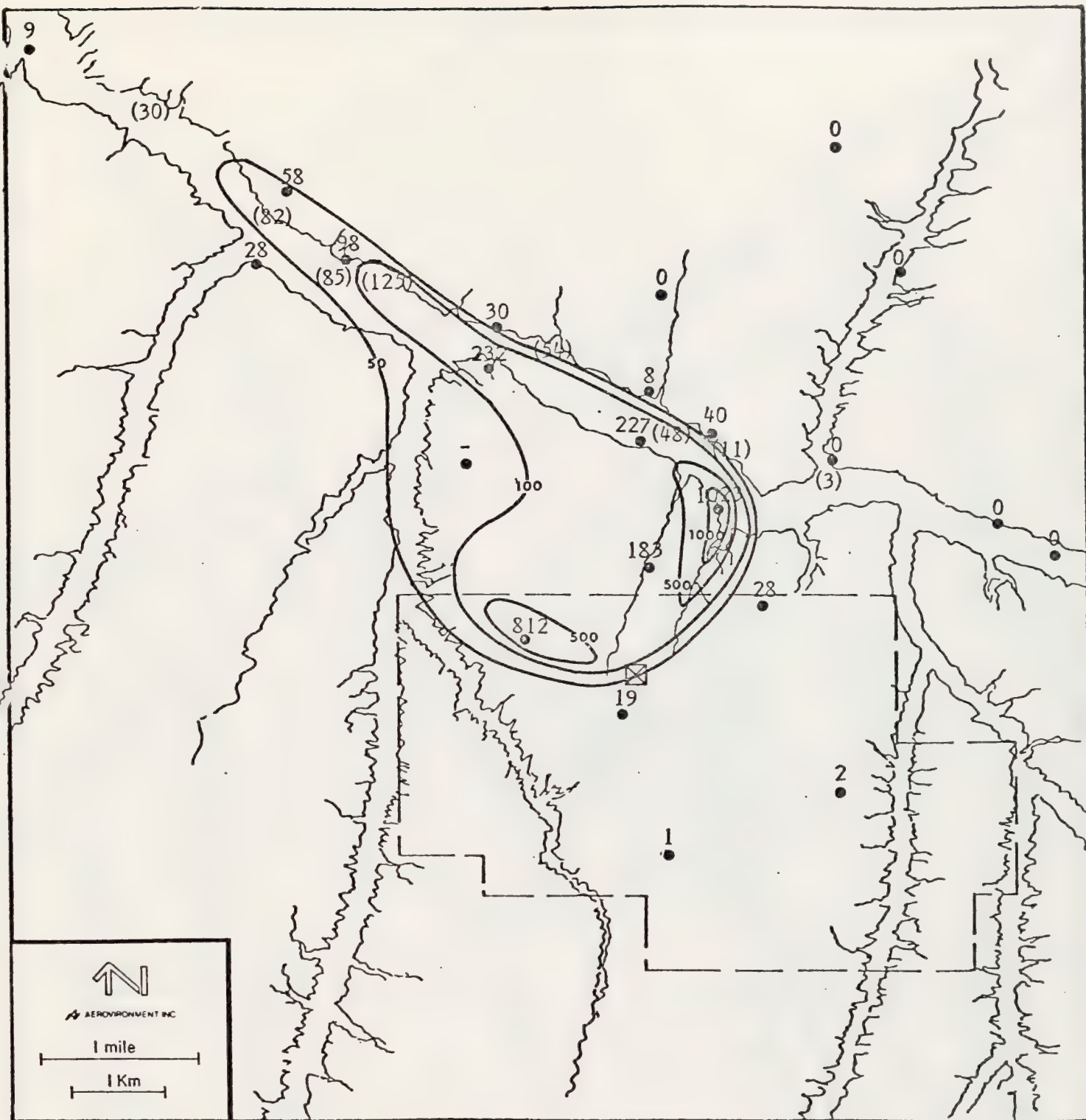


FIGURE 3-14. Isopleths of  $\text{SF}_6$  concentration for hour 0700-0800 MDT on 14 September 1978. Numbers without brackets denote one-hour averaged  $\text{SF}_6$  concentrations (ppt), while numbers with brackets denote instantaneous  $\text{SF}_6$  concentrations (ppt).





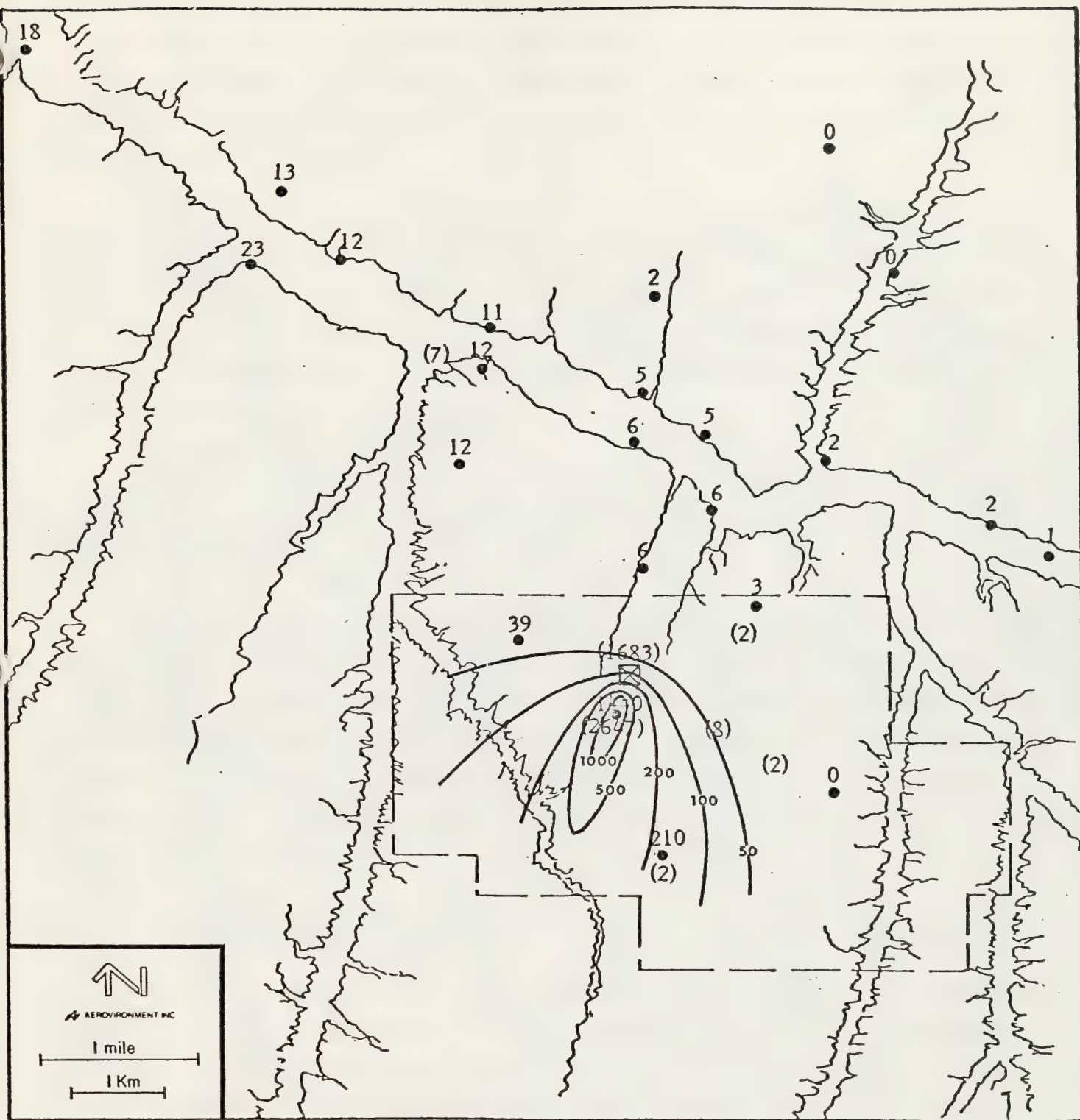


FIGURE 3-16. Isopleths of  $\text{SF}_6$  concentration for hour 0900-1000 MDT on 14 September 1978. Numbers without brackets denote one-hour averaged  $\text{SF}_6$  concentrations (ppt), while numbers with brackets denote instantaneous  $\text{SF}_6$  concentrations (ppt).

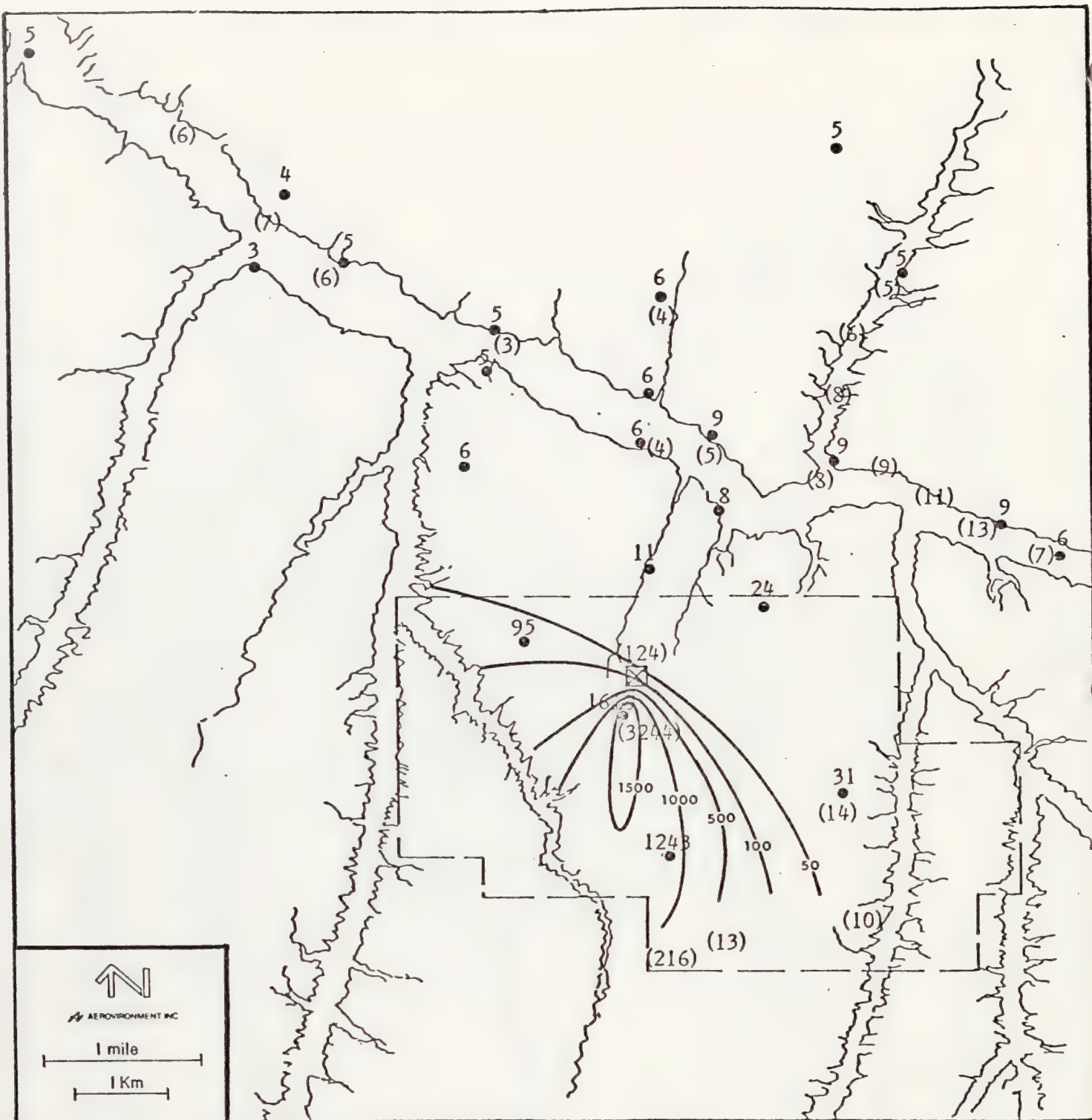


FIGURE 3-17. Isopleths of  $\text{SF}_6$  concentration for hour 1000-1100 MDT on 14 September 1978. Numbers without brackets denote one-hour averaged  $\text{SF}_6$  concentrations (ppt), while numbers with brackets denote instantaneous  $\text{SF}_6$  concentrations (ppt).



drawing the isopleths a bit difficult. Other configurations of isopleths can definitely be derived based on the data. Thus, these figures represent only the authors' conception of the  $\text{SF}_6$  distribution. Although the configuration of such isopleths may vary, the concentrations at the receptors were observations and thus any other configuration must conform to such observations.

In the first hour, high concentrations of  $\text{SF}_6$  were detected at the mouth of Cottonwood Gulch.  $\text{SF}_6$  was also detected along the Piceance Creek east of the mouth of Cottonwood Gulch. This is definitely due to the influence of the drainage wind system. Concentrations were higher on the southern bank of Piceance Creek than on the northern bank. Air flowing down the northern slope of the creek kept the  $\text{SF}_6$  from building up on the northern bank.

A similar pattern was observed in the second hour (0700-0800 MDT). In the following hour the tongue flowing down Cottonwood Gulch into Piceance Creek was almost non-existent.

After 0900 MDT, the  $\text{SF}_6$  isopleths showed that high concentrations were observed only south of the point of release. Although fumigation of the plume definitely occurred during the hour beginning 0900 MDT, its duration must have been very short and thus did not result in any high concentrations when averaged over an hour.  $\text{SF}_6$  was still detected along the creek during the last two hours, not because the plume was over the creek, but because the flow reversal (from drainage to upslope) brought back  $\text{SF}_6$  that was earlier transported down the creek.

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Figures 3-18 through 3-22 show isopleths of  $\text{SF}_6$  concentrations constructed from observations taken on the second day of the experiment. During the first three hours, only minute amounts of  $\text{SF}_6$  were observed at the ground stations. The only location with any measurable quantities to speak of was sampler location #3 to the west-northwest of the release site. Based on the  $\text{SF}_6$  distribution in the last two hours of the experiment (will be discussed shortly) as well as the fact that only a shallow surface-based inversion was observed from the sounding, it was possible that the  $\text{SF}_6$  was lofting above the

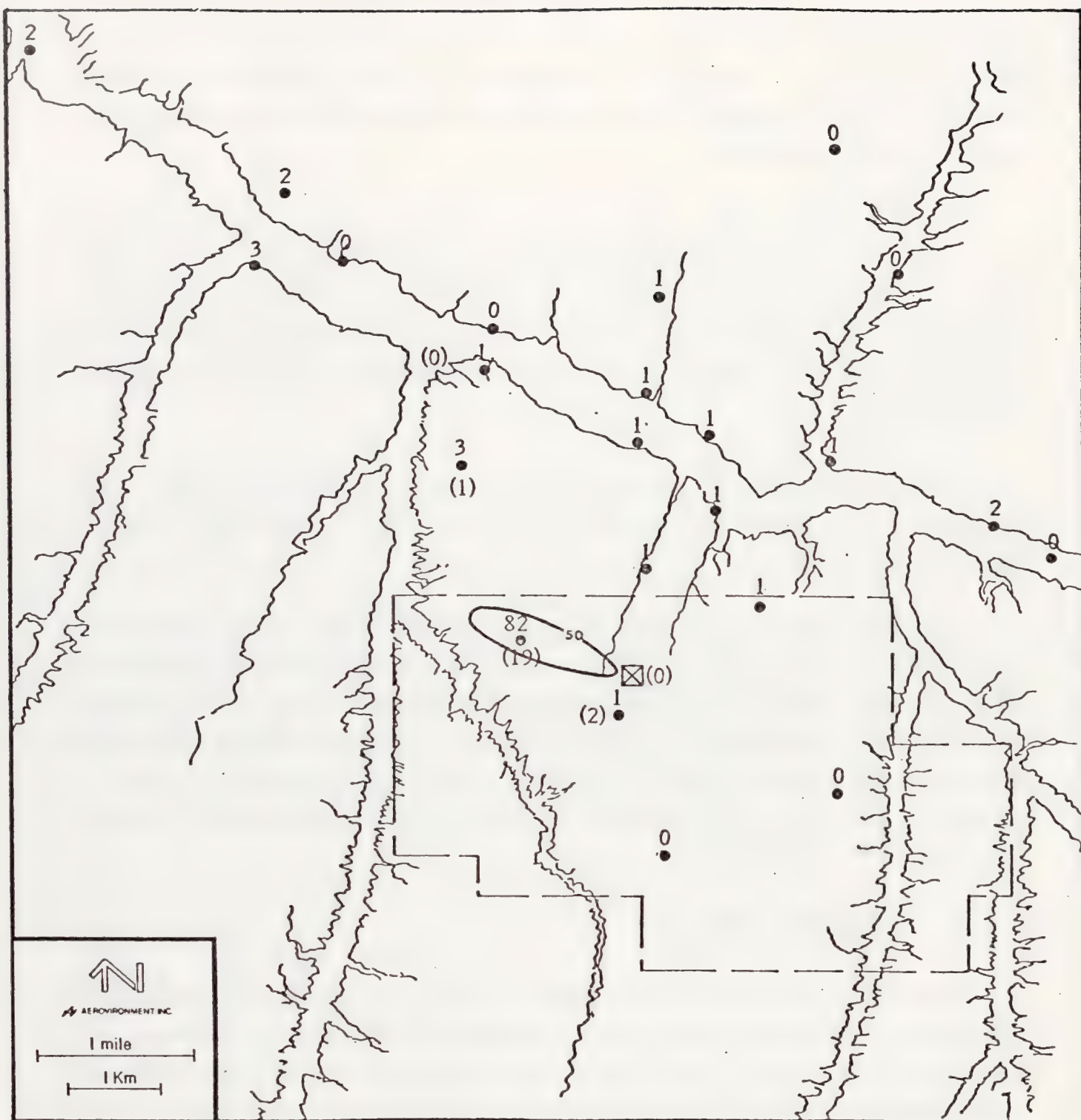


FIGURE 3-18. Isopleths of  $\text{SF}_6$  concentration for hour beginning 0600-0700 MDT on 15 September 1978. Numbers without brackets denote one-hour averaged  $\text{SF}_6$  concentrations (ppt), while numbers with brackets denote instantaneous  $\text{SF}_6$  concentrations (ppt).

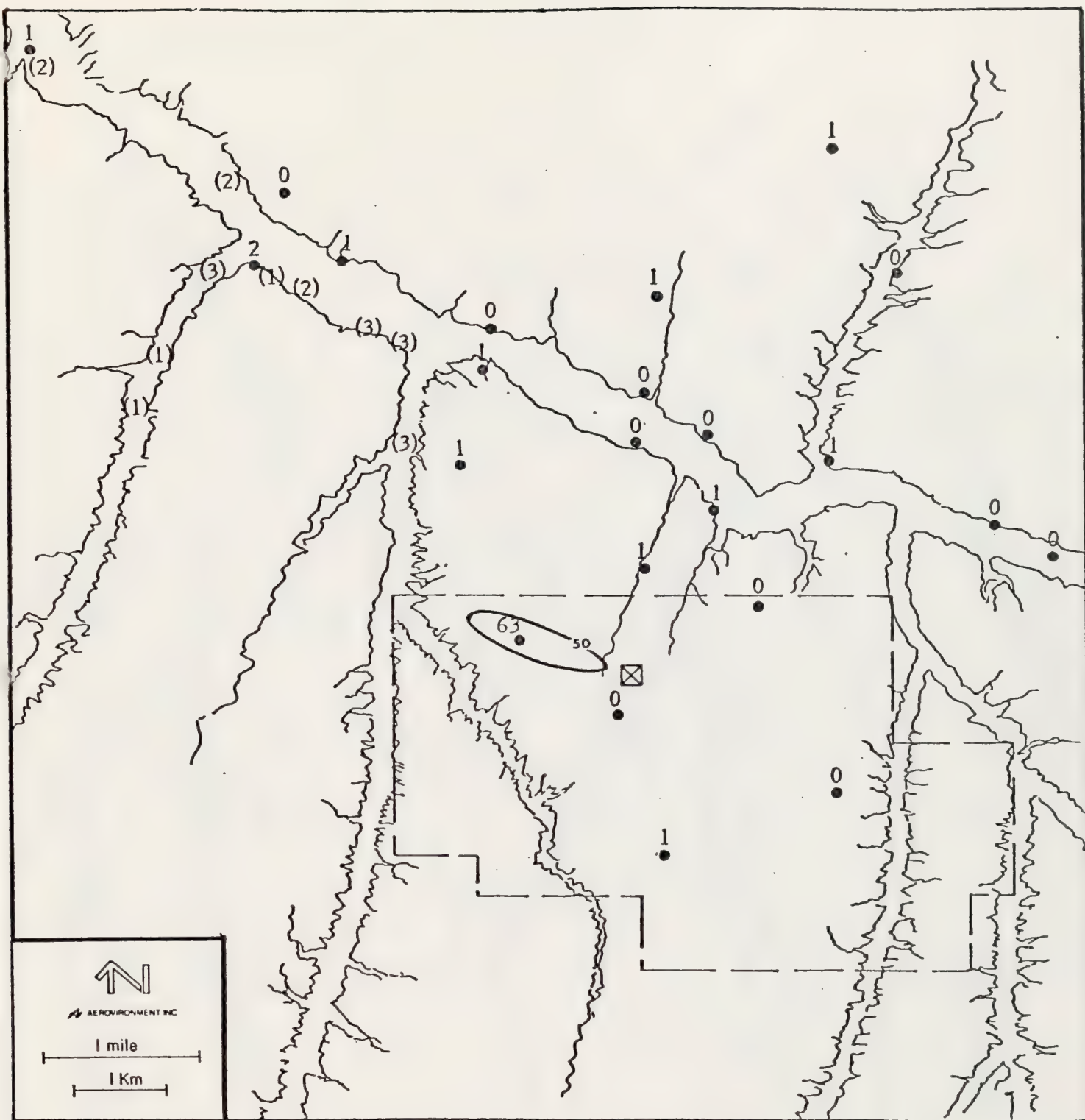


FIGURE 3-19. Isopleths of  $\text{SF}_6$  concentration for hour 0700-0800 MDT on 15 September 1978. Numbers without brackets denote one-hour averaged  $\text{SF}_6$  concentrations (ppt), while numbers with brackets denote instantaneous  $\text{SF}_6$  concentrations (ppt).



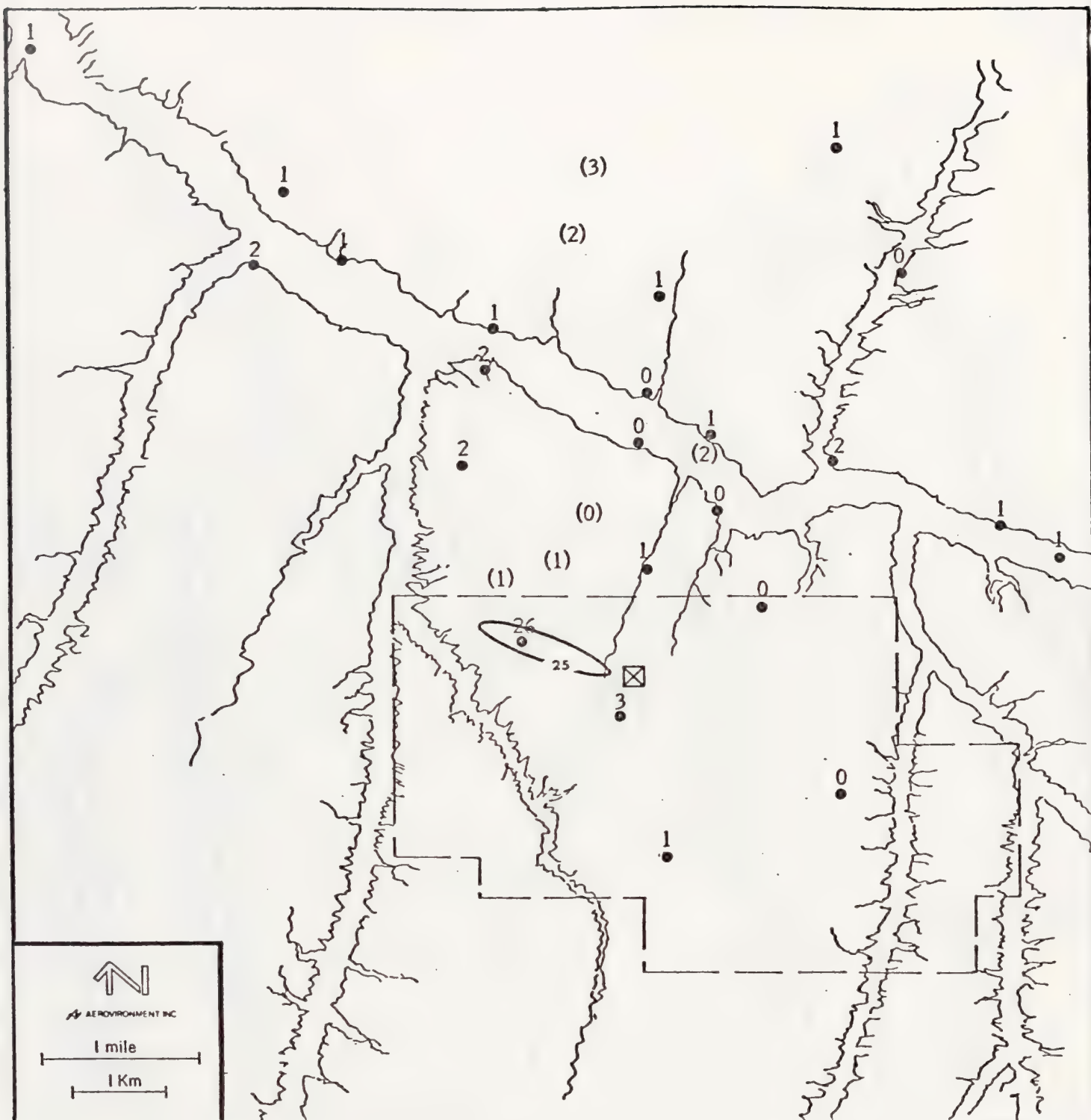


FIGURE 3-20. Isopleths of  $\text{SF}_6$  concentration for hour 0800-0900 MDT on 15 September 1978. Numbers without brackets denote one-hour averaged  $\text{SF}_6$  concentrations (ppt), while numbers with brackets denote instantaneous  $\text{SF}_6$  concentrations (ppt).

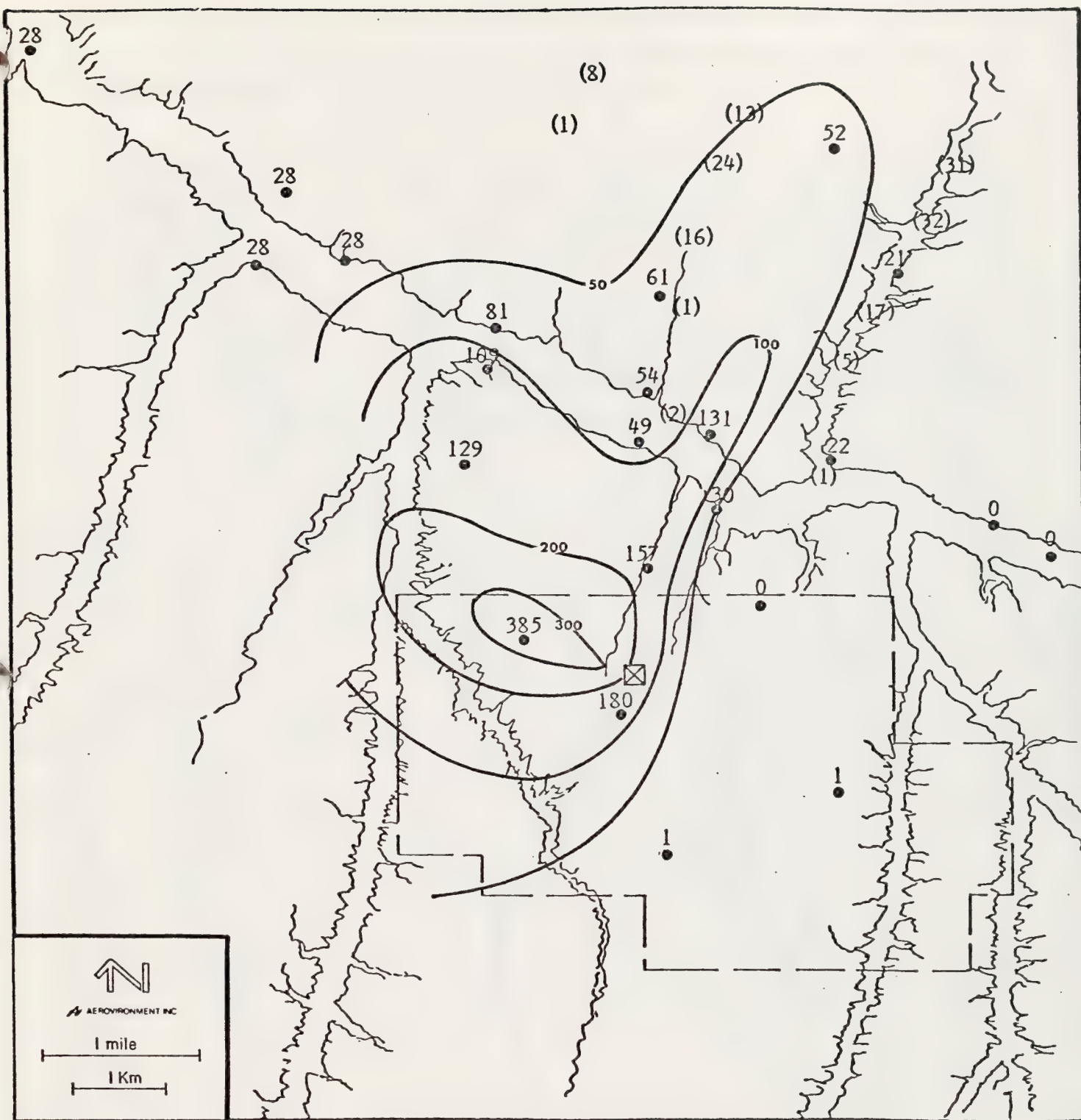


FIGURE 3-21. Isopleths of  $\text{SF}_6$  concentration for hour 0900-1000 MDT on 15 September 1978. Numbers without brackets denote one-hour averaged  $\text{SF}_6$  concentrations (ppt), while numbers with brackets denote instantaneous  $\text{SF}_6$  concentrations (ppt).

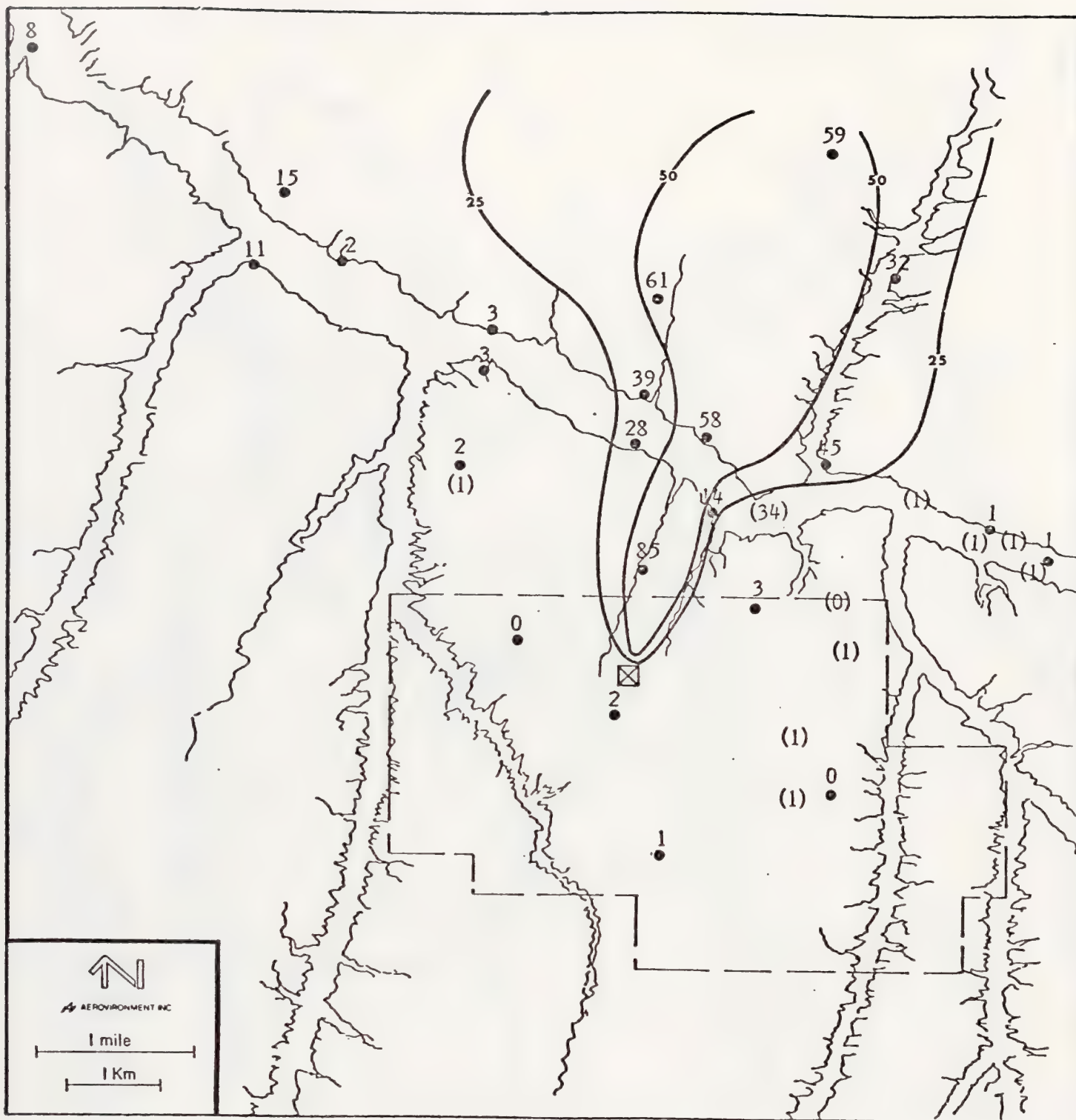


FIGURE 3-22. Isopleths of SF<sub>6</sub> concentration for hour 1000-1100 MDT on 15 September 1978. Numbers without brackets denote one-hour averaged SF<sub>6</sub> concentrations (ppt), while numbers with brackets denote instantaneous SF<sub>6</sub> concentrations (ppt).



surface-based inversion. As the wind was still generally from the east, it was also possible that whatever minute amounts that got into the surface layer were transported to the west with some finding their way down to the Piceance Creek.

The last two hours of  $SF_6$  distribution showed that the  $SF_6$  plume was responding to the synoptic wind flow. High concentrations were observed north and west of the point of release, down the creek and up along the south-facing slope across the creek in the hour beginning 0900 MDT. The  $SF_6$  distribution during this hour was a little bit more complicated than the one in 1000-1100 MDT, because of the transition from weak drainage to synoptic flow. The distribution for the last hour was quite straightforward. It showed that the plume was traveling down the creek and up the slope on the other side, following the synoptic wind which was out of the south-southwest.

#### 4. OBSERVATIONS

A number of observations can be deduced from the results of the experiment.

- (1) On 14 September, when the synoptic pressure gradients were weak, local meteorology was responsible for the transport and diffusion of pollutants during nighttime and early morning hours. Under such a situation, the synoptic wind flow was not able to establish itself until after mid-day.
- (2) When the plume was released within a layer of very stable air in complex terrain, the plume followed constant potential temperature surfaces, which followed the contour of the ground. It did not just fan out and stay at the same elevation above sea level. In specific, the plume flowed into Piceance Creek and followed the creek downstream rather than traveling across the creek at the level of release and impinging on the surface of the south-facing slope north of Piceance Creek. Contrary to observations of a fanning plume on flat terrain, a fanning plume over tract C-b did get down to the ground surface due to turbulence associated with the shearing effect of the drainage wind.
- (3) Fumigation of the plume did not result in high concentrations when measurements were averaged over a period of one-hour or more.
- (4) On 15 September, when the surface-based inversion was shallow, the plume lofted above the inversion and pollutant concentrations at the surface were miniscule.
- (5) When the plume was released in a neutral-lapsed layer, the plume centerline followed the contour of ground surface as it traveled downwind.

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- Chan, M.W., J.B. Mullen, and I.H. Tombach (1977): AVMSTM, a model for dispersion in complex terrain. (AV M 7133R, AeroVironment Inc., Pasadena, CA).
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- Morris, A.L. (1977): Synthesizing mining data at the C-b oil shale tract. Ambient Analysis, Inc., Boulder, Colorado.



## APPENDIX A

### Meteorological Data

TABLE A-1. Meteorological data, 14 September 1978.

Site	Parameter	Time (MDT)									
		0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100			
20	W10	110/4.0	105/4.0	105/4.0	105/3.0	320/5.0	295/6.0	300/7.0			
22	W10	100/7.5	080/5.0	090/5.5	100/6.5	100/7.5	095/6.5	295/7.5			
	T10	-1.4	-2.4	-2.5	-2.4	2.0	8.1	14.3			
23	W10	VAR/2.0	205/2.5	300/2.0	120/2.0	VAR/1.5	045/2.0	360/2.0			
	W30	VAR/1.0	VAR/1.0	300/1.5	220/2.0	090/1.0	090/2.5	030/4.0			
	W60	015/1.5	215/1.5	300/1.5	220/1.5	035/1.5	095/2.5	025/4.0			
	T10	7.2	7.5	5.5	5.2	6.2	9.1	12.3			
	T60	8.5	8.5	7.0	7.0	7.5	9.5	12.0			
	$\Delta T$	1.3	1.0	1.5	1.8	1.3	0.4	-0.3			
	$\sigma_w$ (m/sec)	.03	.03	.02	.02	.04	.04	.02			
	$\sigma_\theta$ (deg.)	6	9	6	7	19	26	22			
24	W10	290/IM	VAR/IM	VAR/IM	050/IM	330/IM	300/IM	195/IM			
	T10	1.4	1.5	3.1	8.4	3.6	16.3	19.2			
42	W10	055/3.0	070/2.5	065/2.5	040/2.0	340/3.0	280/5.0	220/11.0			
	T10	-1.8	-2.5	-2.4	2.9	9.2	12.6	16.8			
45	W10	345/1.5	325/1.5	335/1.5	130/1.0	115/1.5	145/3.0	150/4.0			
	T10	-1.3	-1.6	-2.2	-0.4	4.6	10.1	13.9			
46	W10	115/2.0	115/2.5	120/3.0	140/2.5	260/2.5	280/2.0	030/2.0			
	T10	-1.3	-1.7	-1.1	4.6	10.7	16.4	21.5			
56	W10	160/4.5	135/3.0	140/3.0	095/2.0	210/7.0	310/9.5	255/8.5			
	T10	-5.3	-6.2	-4.2	1.5	6.2	9.8	14.9			

Note:

All temperatures in °C, wind directions in degrees, wind speeds in miles per hour, VAR means variable direction, and IM means instrument malfunction.

TABLE A-2. Meteorological data, 15 September 1978.

Site	Parameter	Time (MDT)							
		0400-0500	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	
20	W10	140/5.0	140/5.0	100/4.0	130/4.0	110/2.0	190/8.0	220/8.0	
22	W10	050/3.0	070/4.0	105/8.0	110/7.5	075/4.0	100/4.5	055/4.0	
	T10	5.0	4.1	4.0	4.1	3.2	5.9	11.4	
23	W10	100/5.0	110/4.0	180/3.5	125/2.0	225/7.5	210/14.5	210/IM	
	W30	110/5.5	125/3.5	190/5.0	180/3.0	230/6.5	225/13.0	230/14.0	
	W60	120/4.0	155/4.0	175/8.5	180/3.0	230/6.0	220/12.5	220/14.0	
	T10	5.8	7.2	5.6	12.6	14.4	15.0	16.9	
	T60	9.5	9.5	10.0	11.5	13.5	14.0	15.5	
	$\Delta T$	3.7	2.3	4.4	0.9	-0.9	-1.0	-1.4	
	$\sigma_w$ (m/sec)	.03	.03	.03	.03	.03	.03	.03	
	$\sigma_\theta$ (deg.)	14	15	26	25	26	20	23	
24	W10	120/IM	110/IM	090/IM	055/IM	280/IM	205/IM	210/IM	
	T10	6.3	5.7	6.2	11.2	15.0	17.5	19.2	
42	W10	100/8.0	085/5.5	070/4.0	020/2.5	310/3.5	185/14.0	180/14.0	
	T10	4.7	3.8	4.2	7.2	13.4	15.9	17.8	
45	W10	005/1.0	340/1.5	355/1.5	020/.5	065/.5	120/3.5	150/10.5	
	T10	5.7	4.5	3.9	5.8	10.3	15.7	16.9	
46	W10	115/4.0	115/4.0	120/3.5	120/2.5	140/2.5	155/8.5	165/8.5	
	T10	6.7	6.0	5.4	9.7	17.3	21.0	22.9	
56	W10	125/5.0	125/4.5	120/4.0	070/4.5	090/2.5	180/9.5	180/10.5	
	T10	2.1	2.2	2.7	7.6	14.8	18.9	20.7	

Note:

All temperatures in °C, wind directions in degrees, wind speed in miles per hour, IM means instrument malfunction.



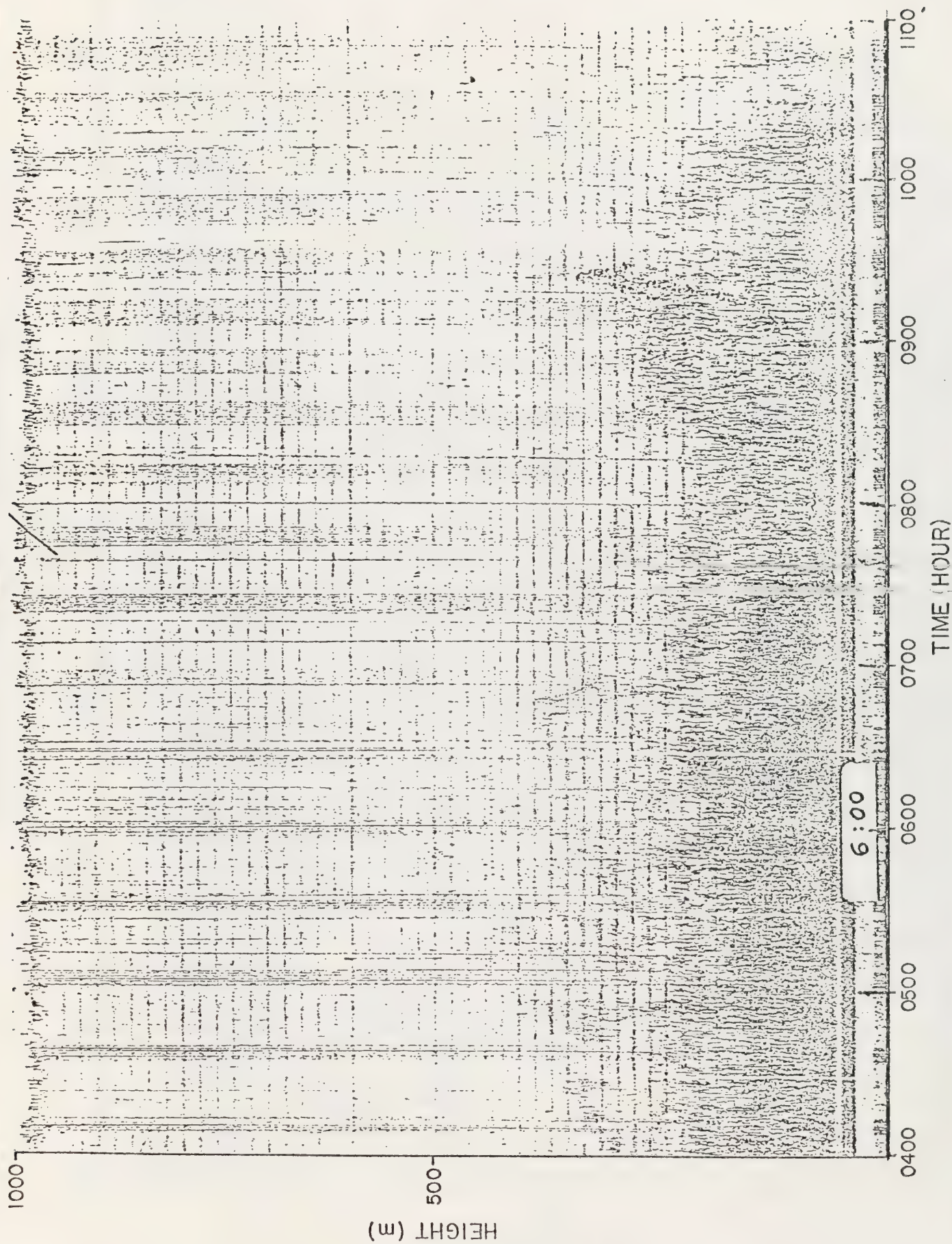


FIGURE A-1. Acoustic radar, 14 September 1978.



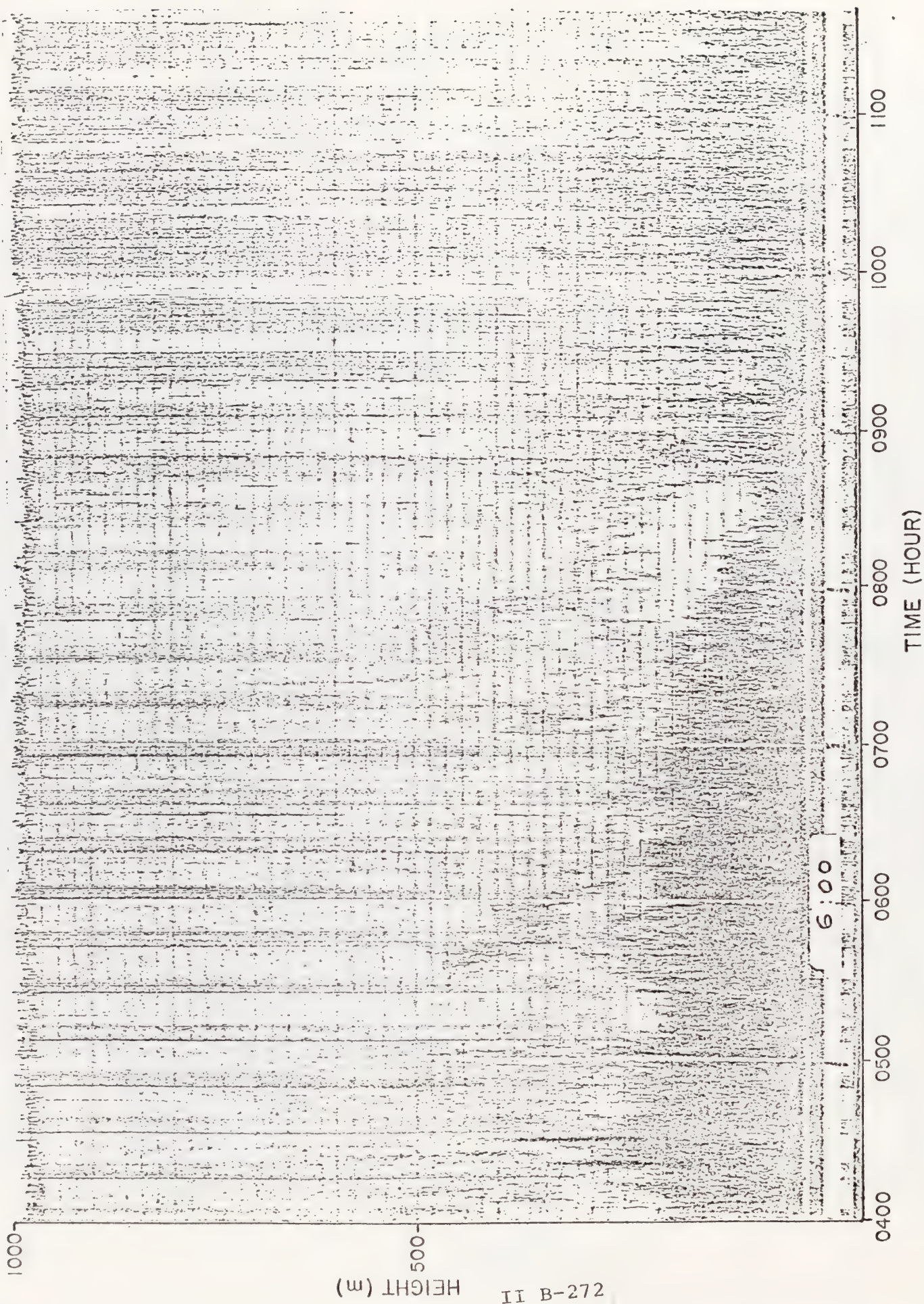
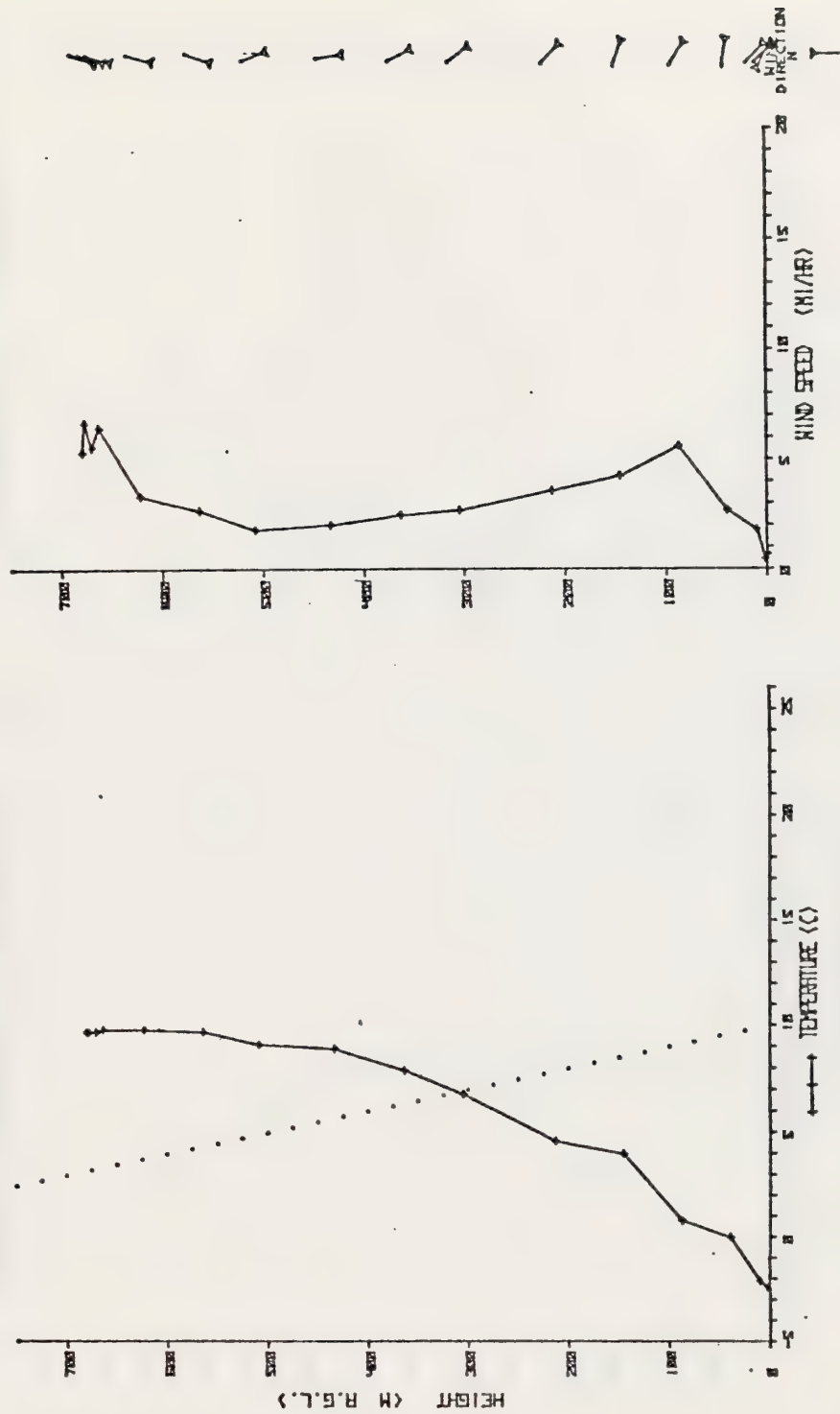


FIGURE A-2. Acoustic radar, 15 September 1978.

HERDY/RODMONT INC. TETHERBUNDE

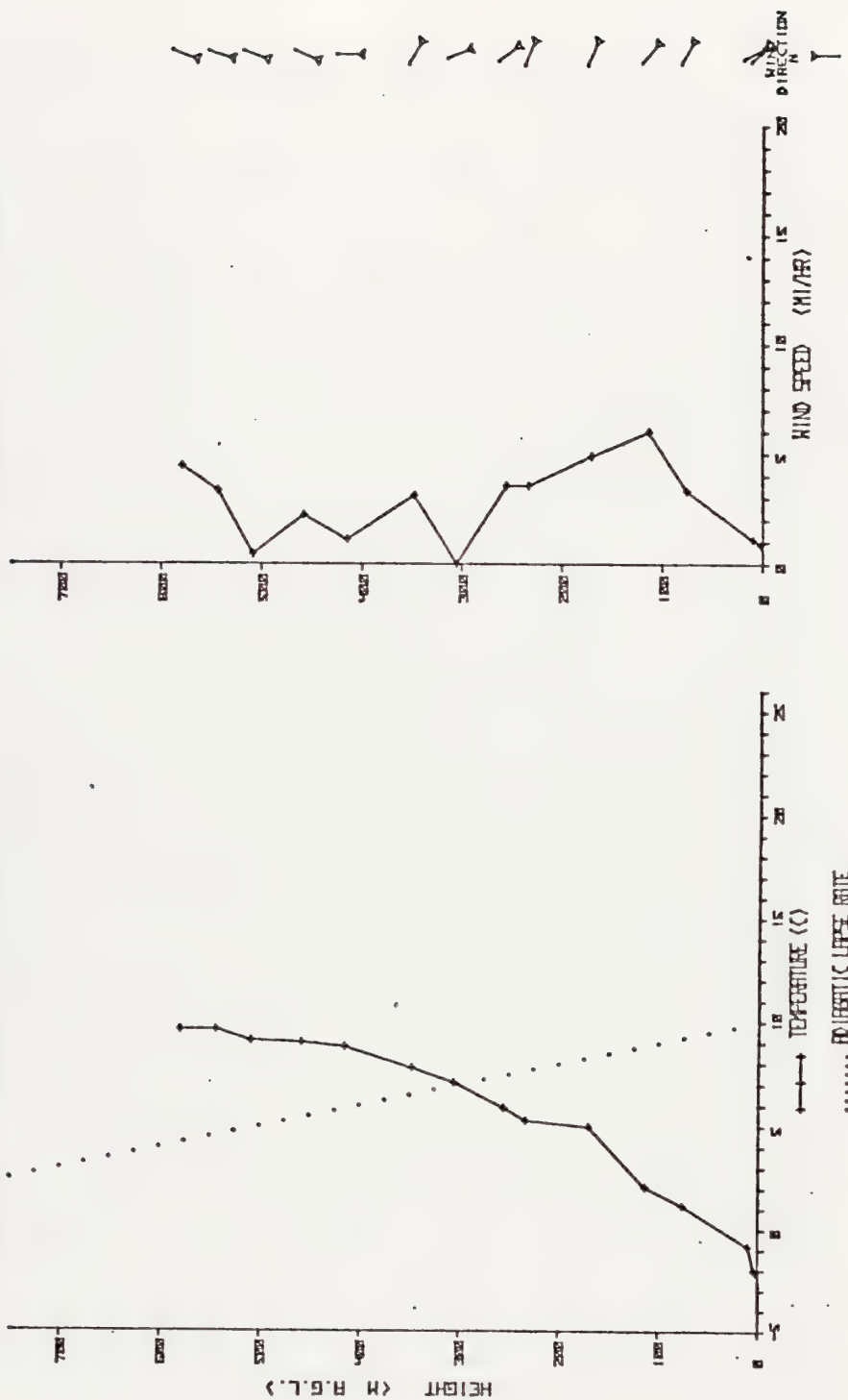
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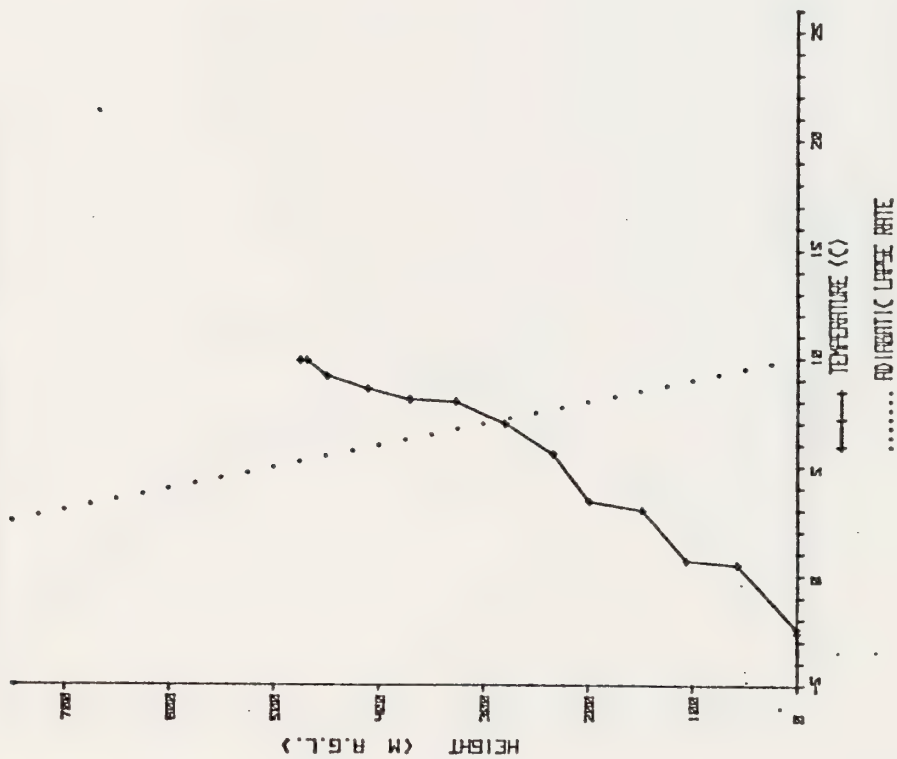
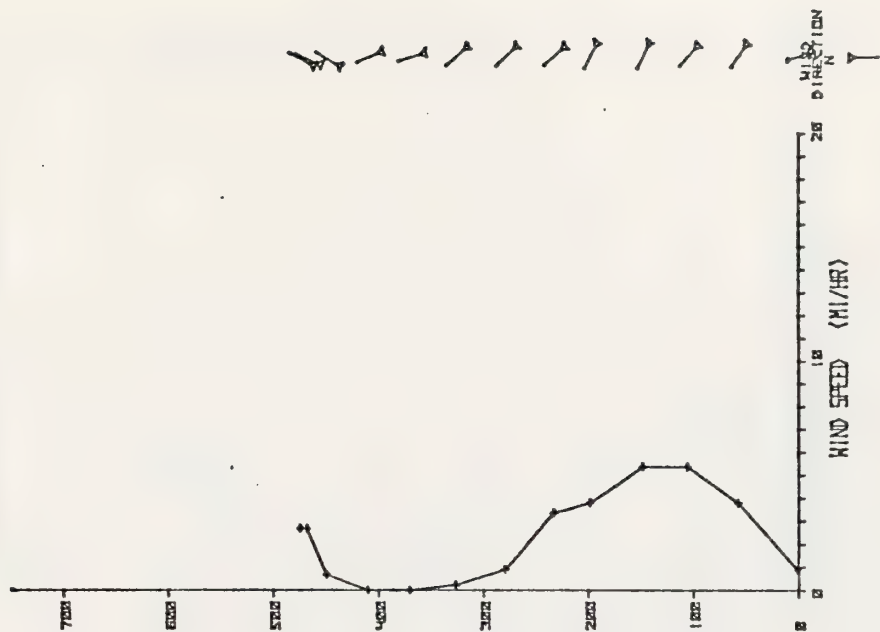
HEROIRONMENT INC. TETHERBOMBE

C-8 OIL SPULE DATE 9/14/78 TIME 529



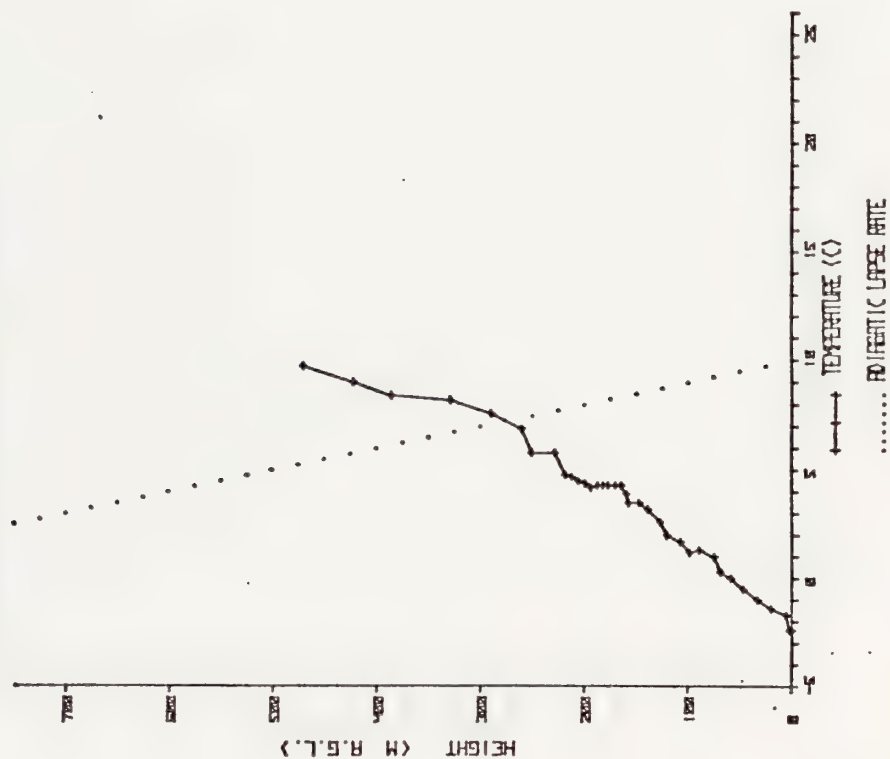
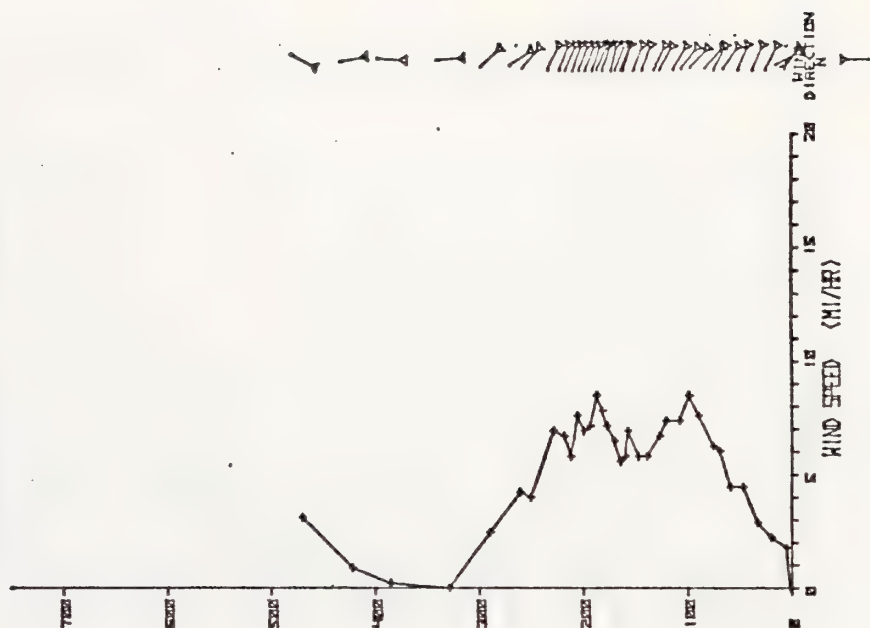
PEROVIRONMENT INC. TETHERSONDE

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HERBYRONMENT INC. TETHERSONDE

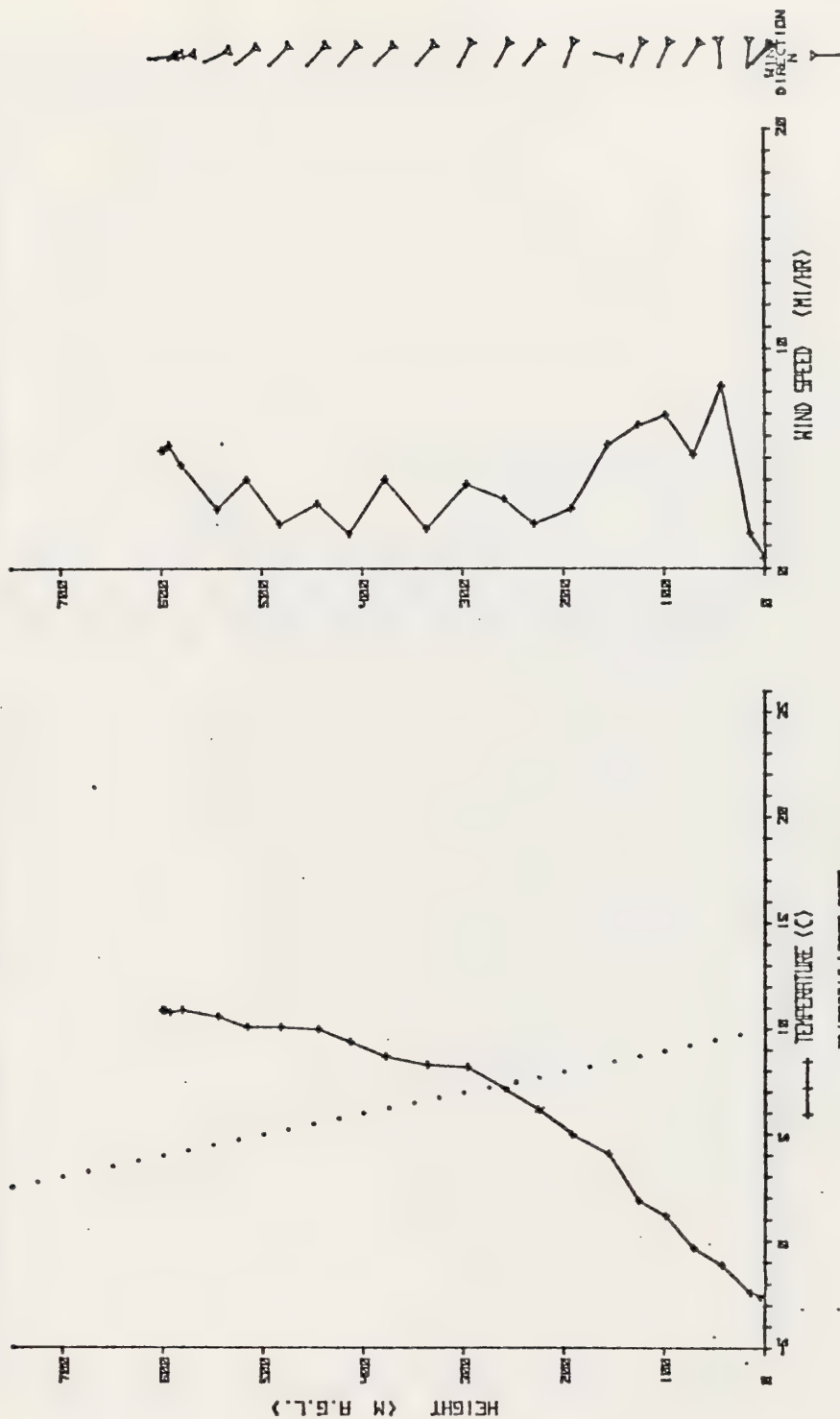
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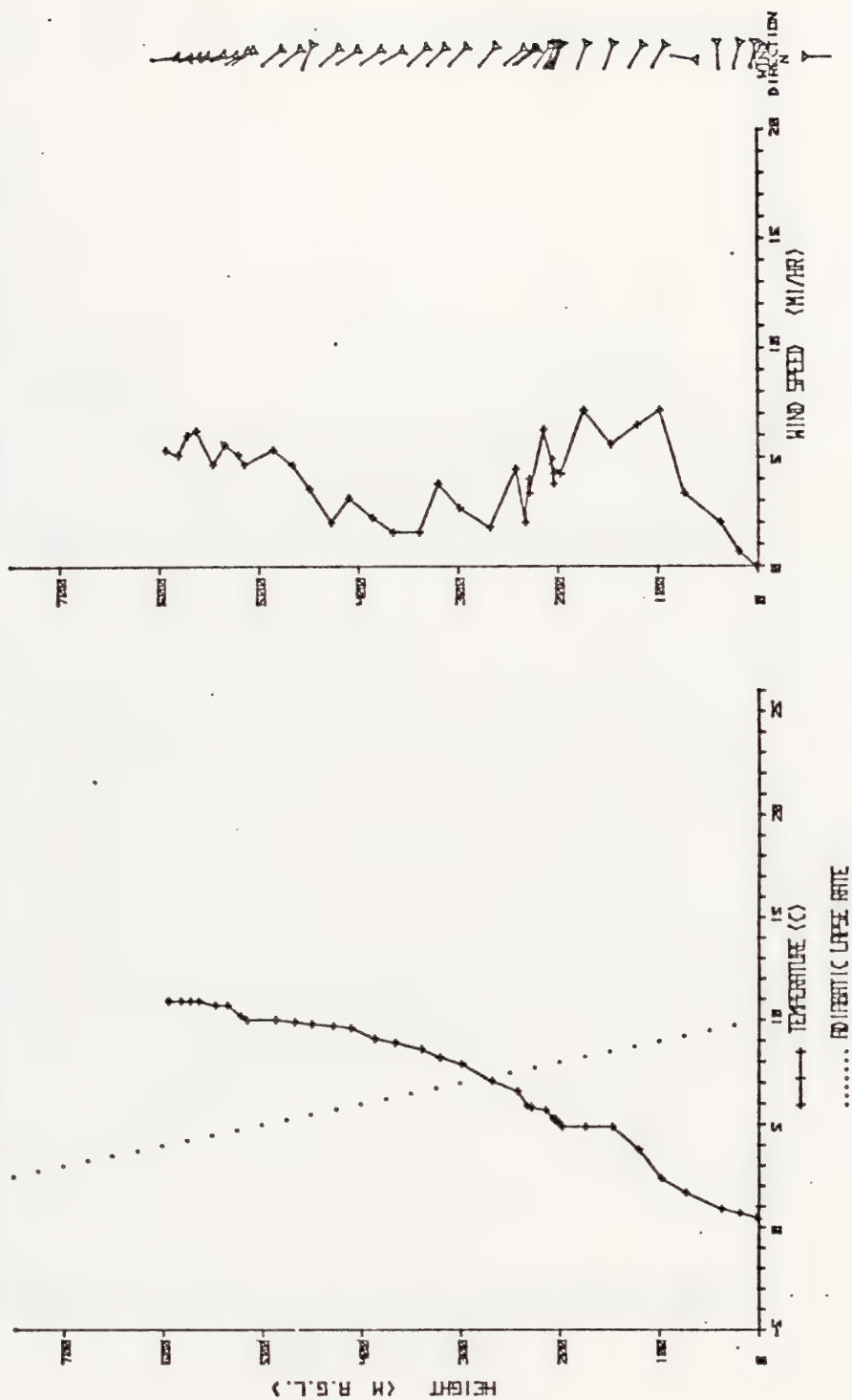
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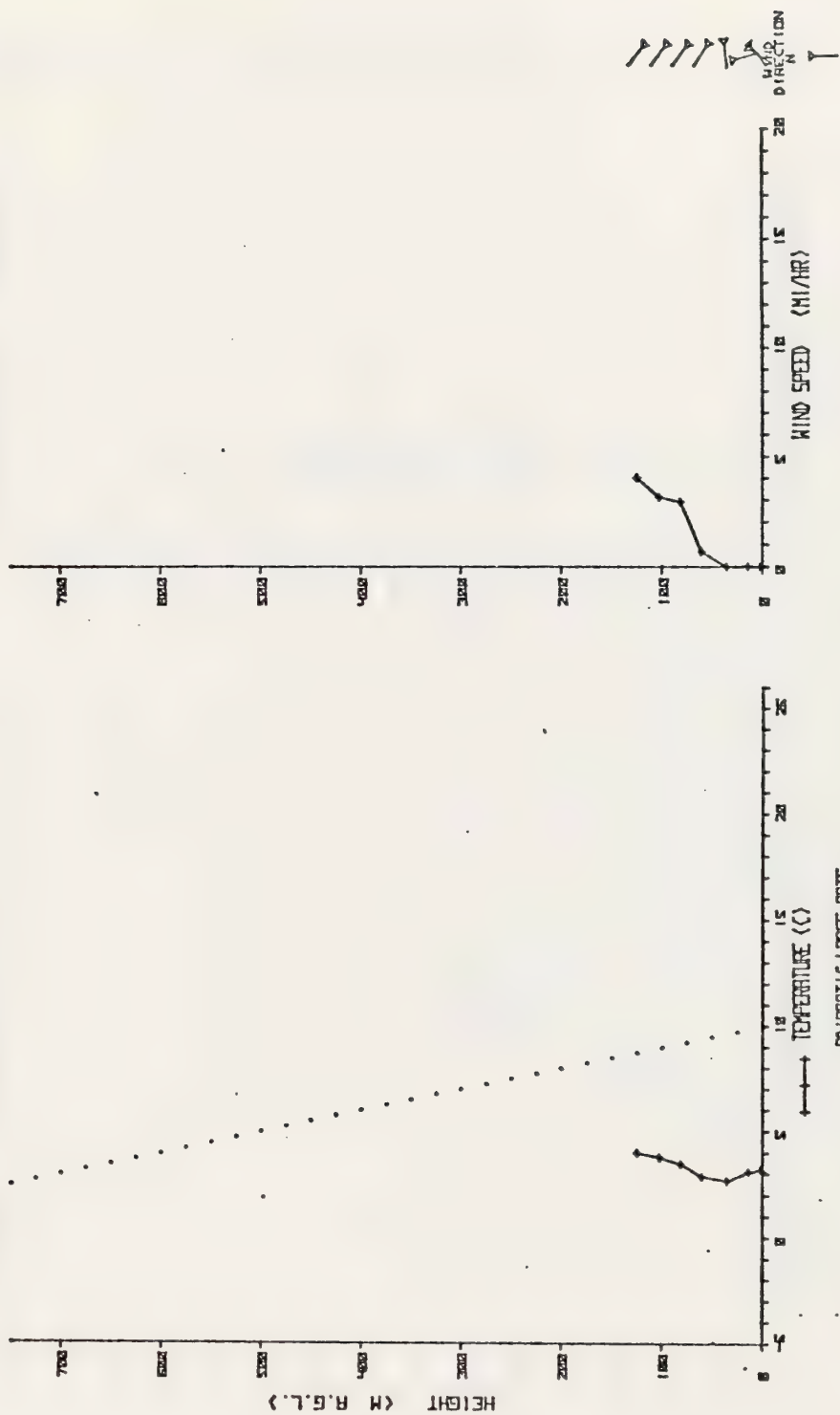
HERBYRONMENT INC. TETHERSONDE

C-8 OIL SHALE DATE 9/14/78 TIME 721



PEROVIRONMENT INC. TETHERSONDE

C-8 OIL SHALE DATE 9/14/78 TIME 755





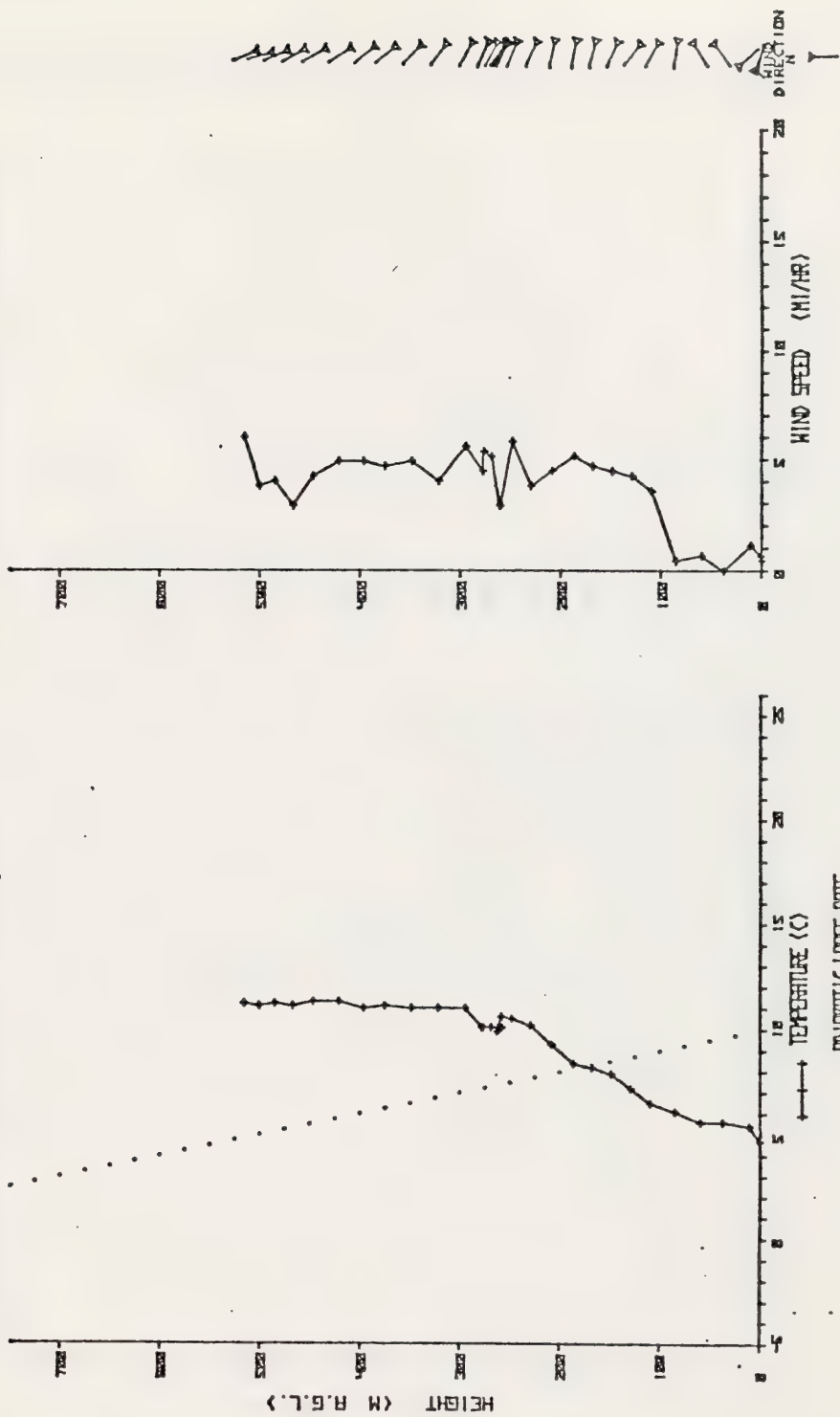
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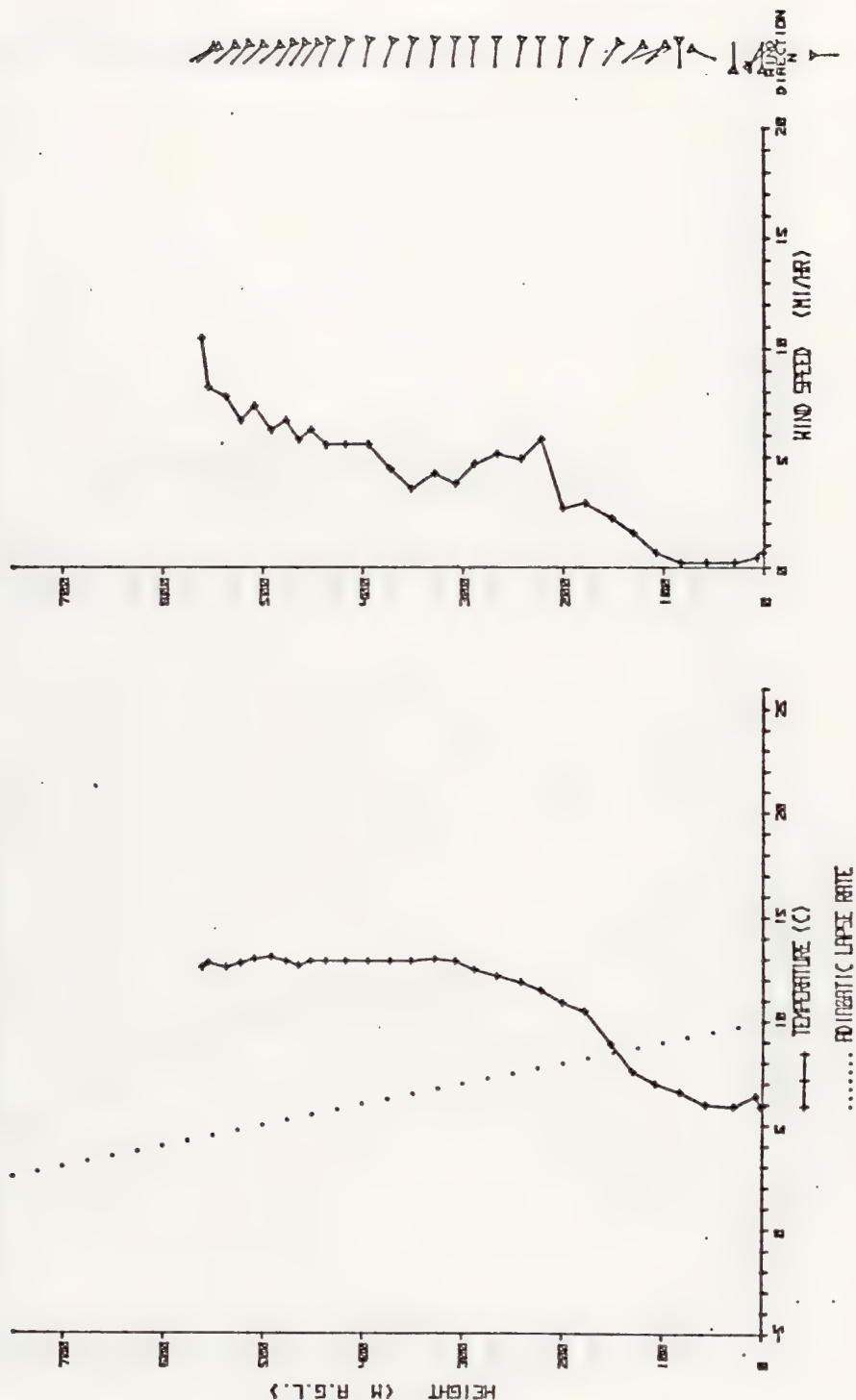
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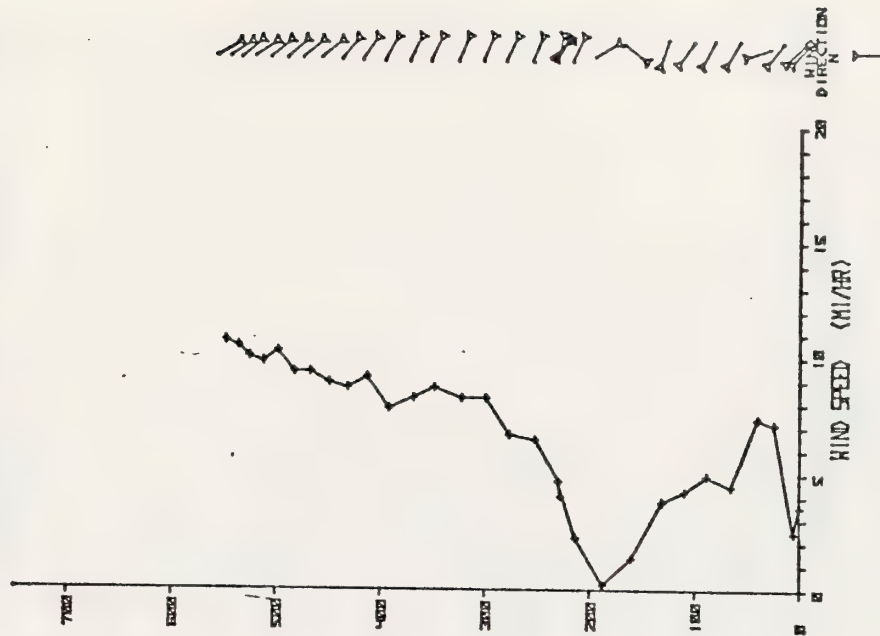
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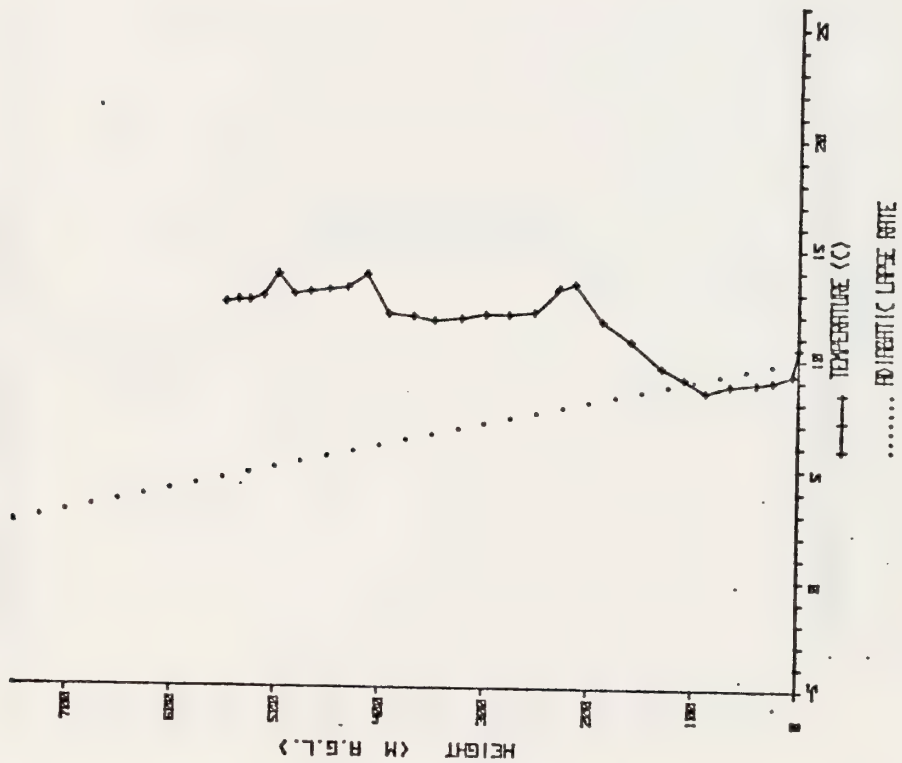


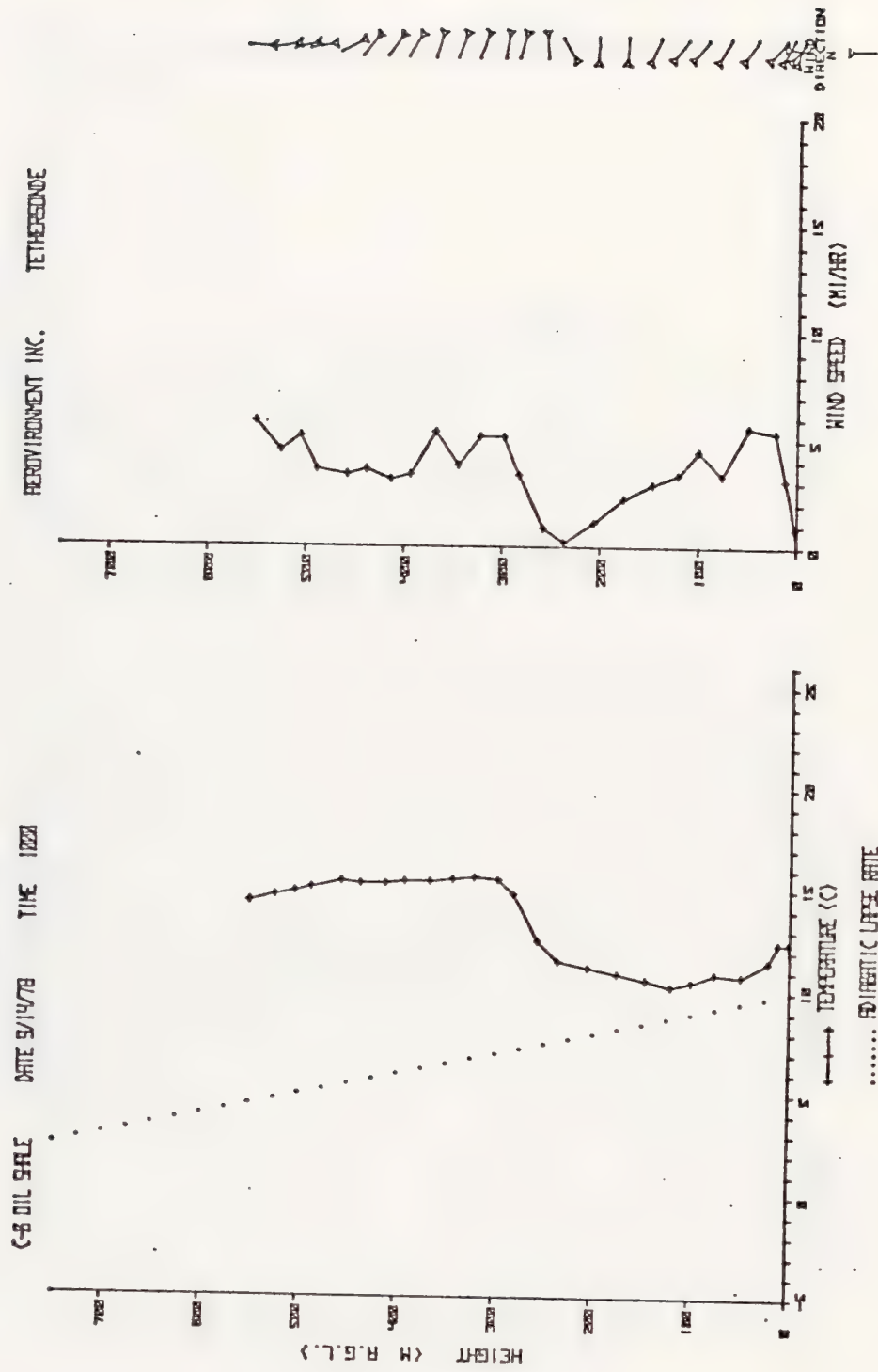


HERO/IRONMENT INC. TETHERBOND



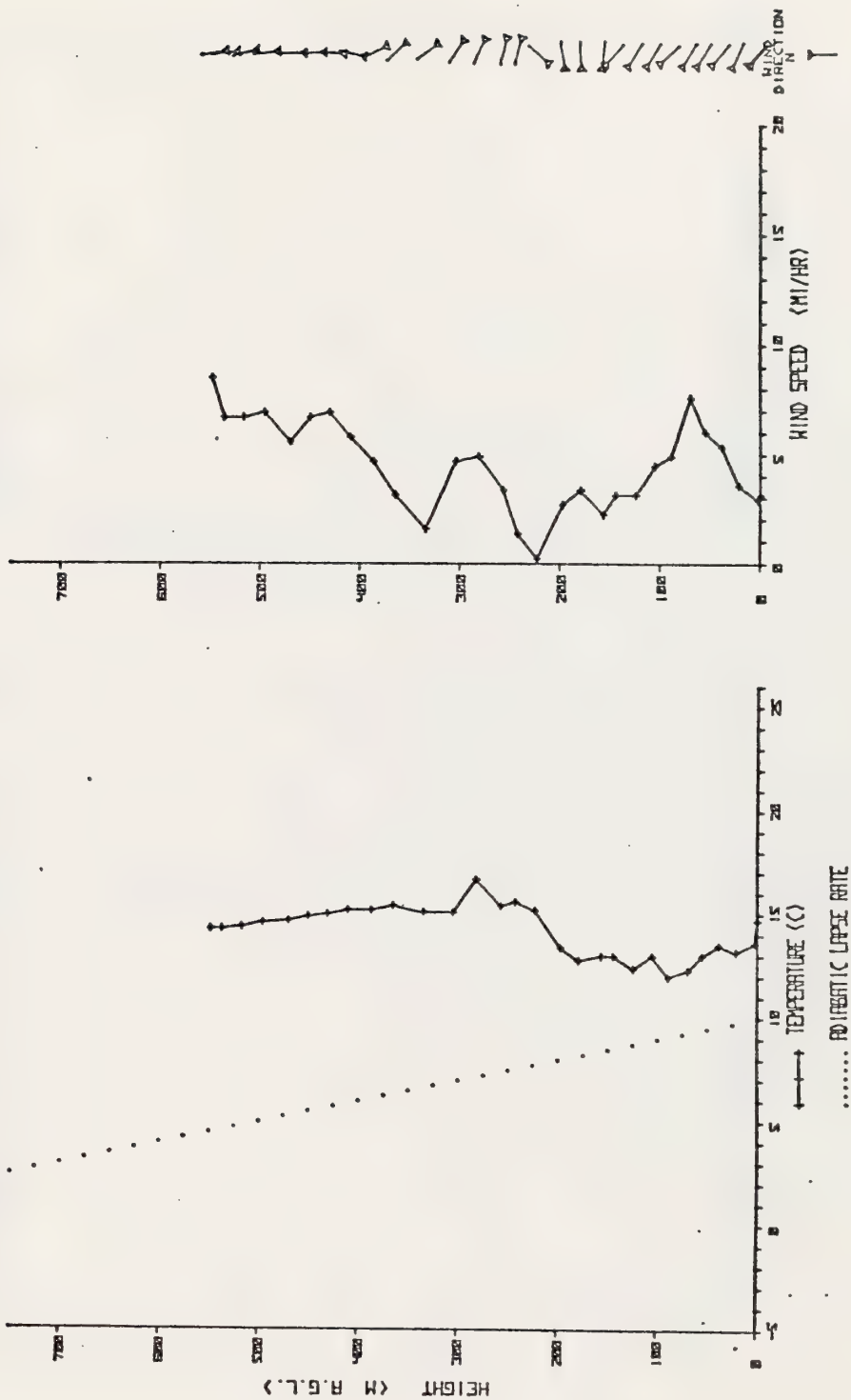
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PERVIRONMENT INC. TETHERSONDE

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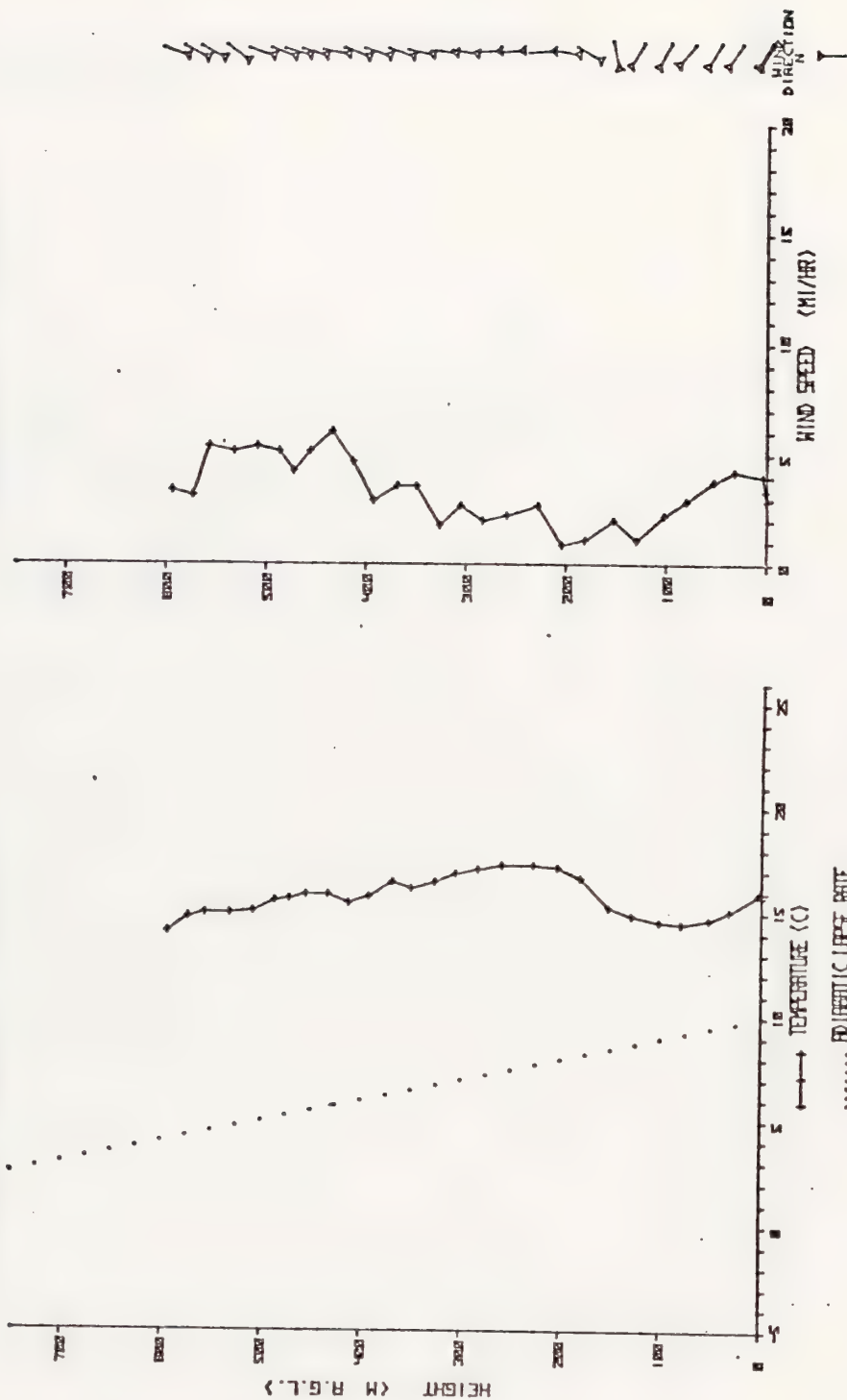


C-B OIL SHALE

DATE 9/14/78

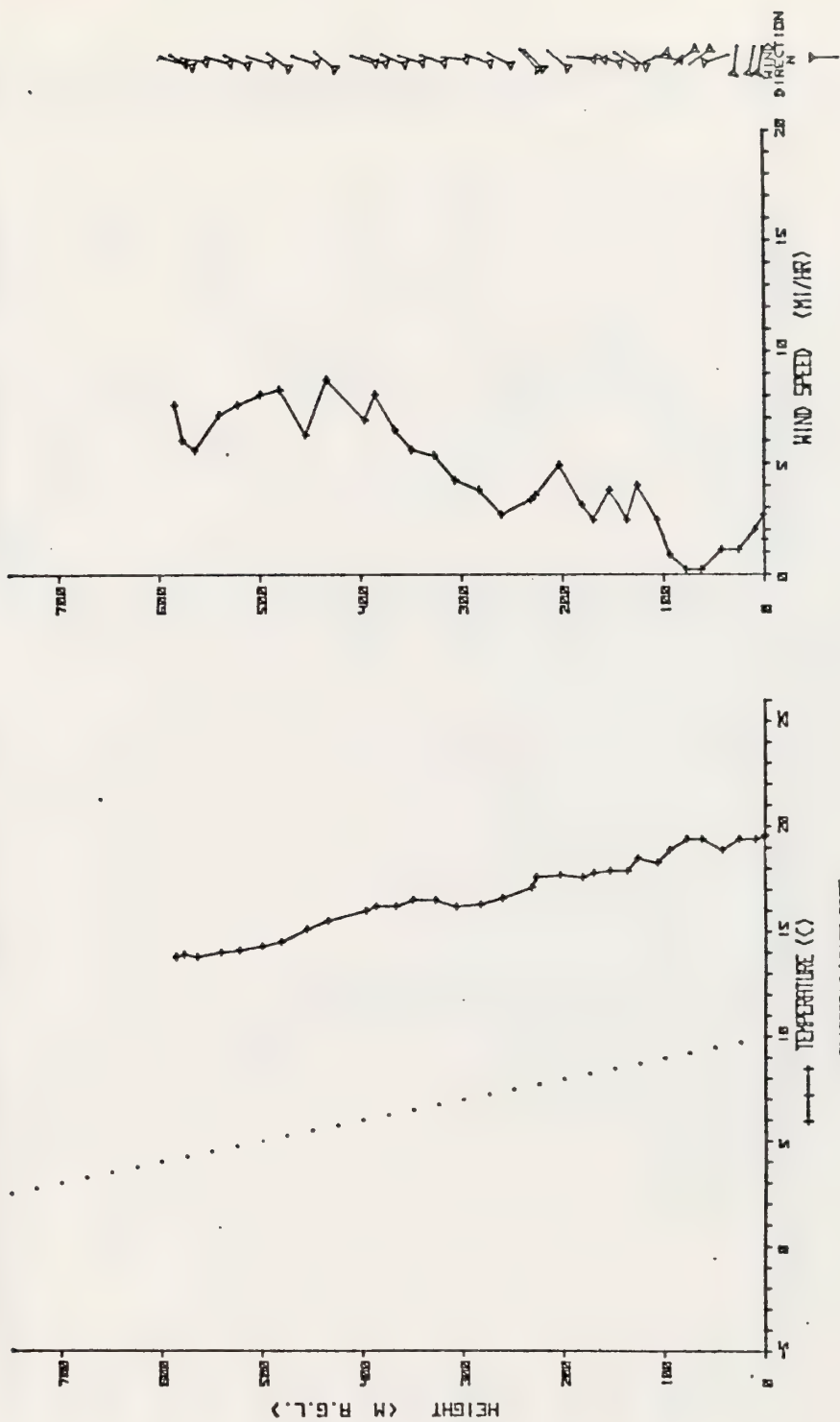
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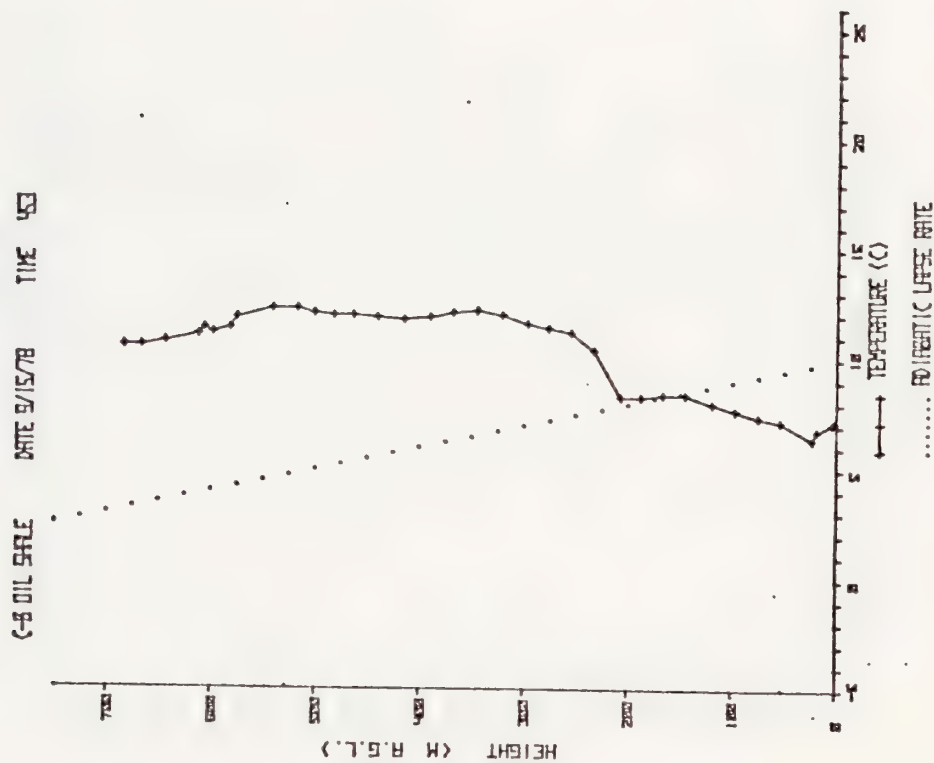
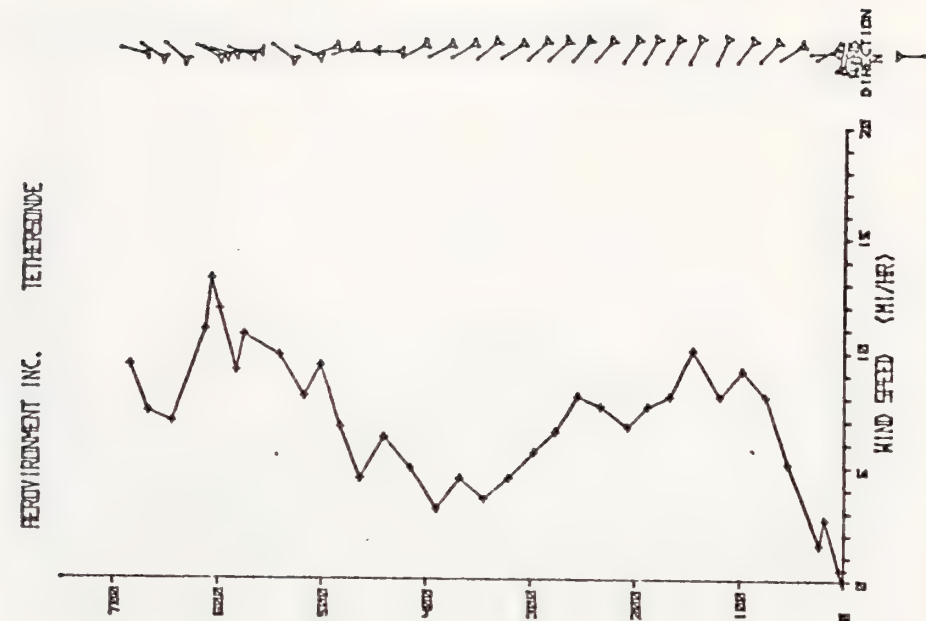
TETHERSOUND



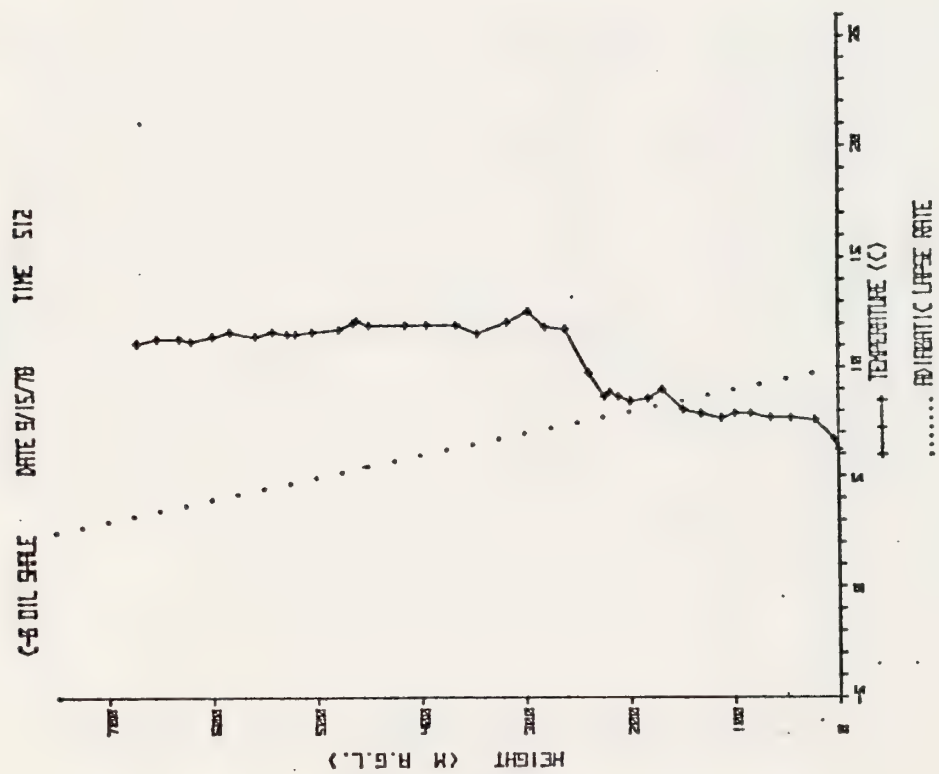
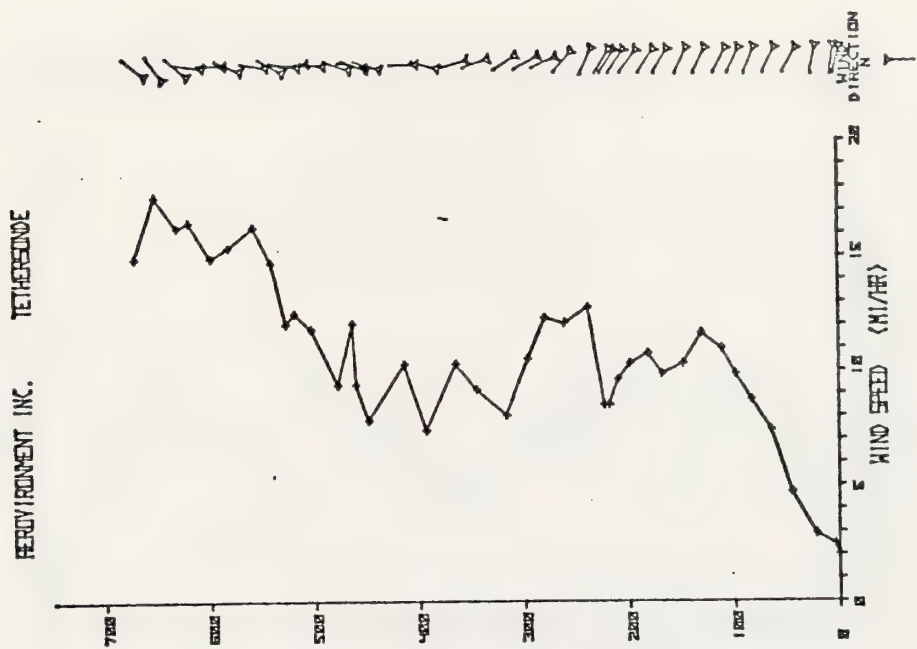
PERGOVIRONMENT INC. TETHERSONDE

G-B OIL GAUGE DATE 9/14/78 TIME 1112



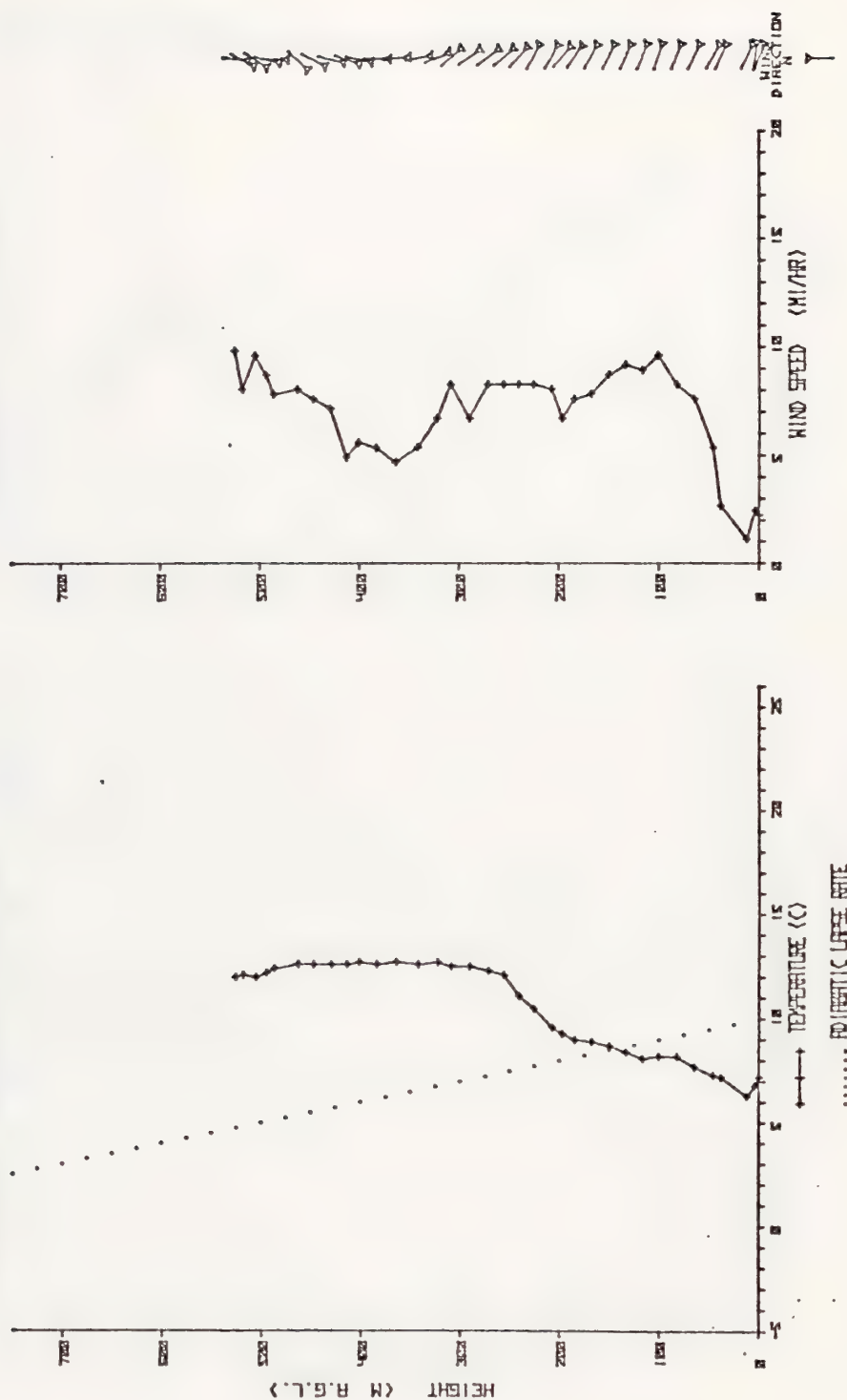






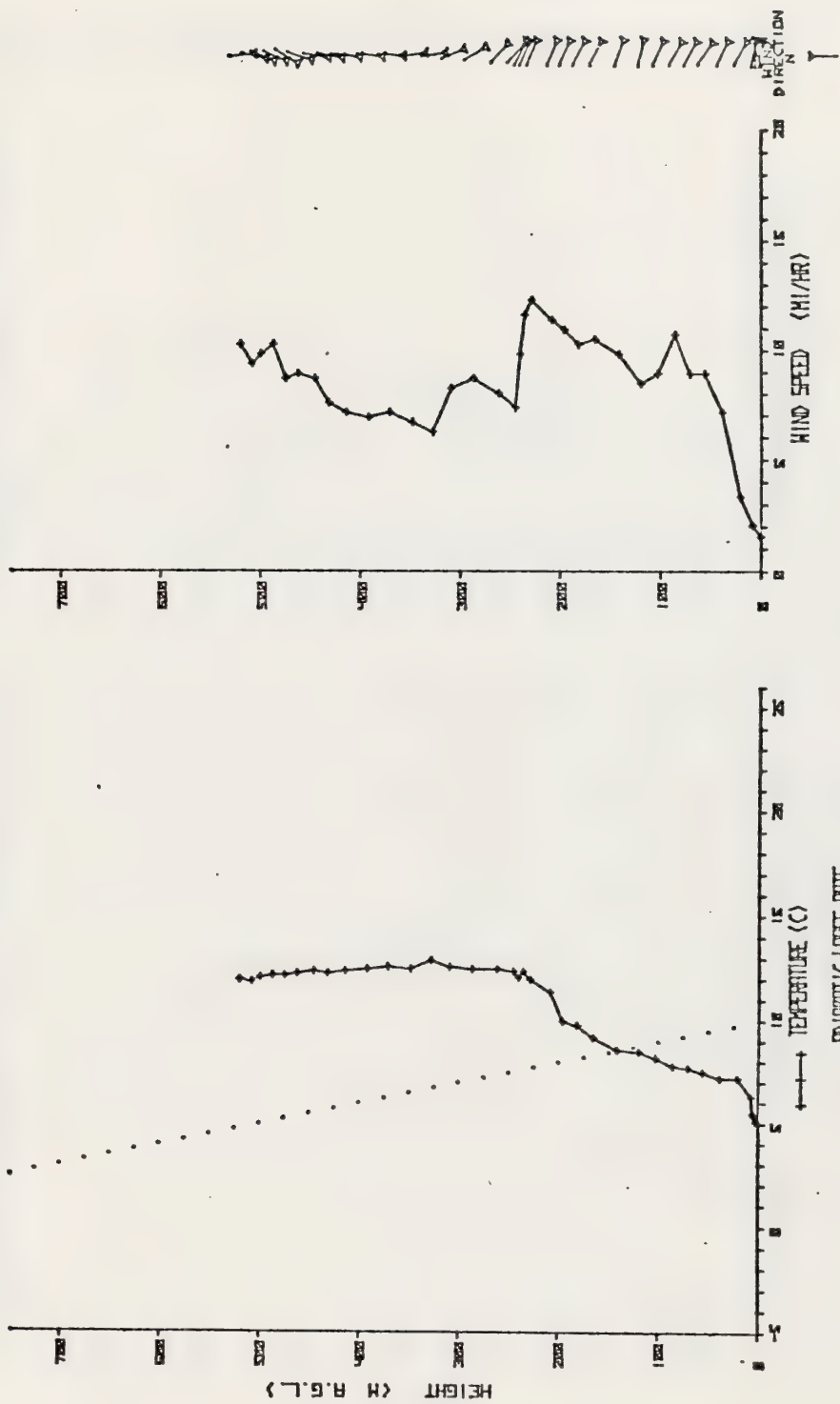
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C-8 OIL SHALE DATE 9/15/78 TIME 520



PERVIRONMENT INC. TETHERSONDE

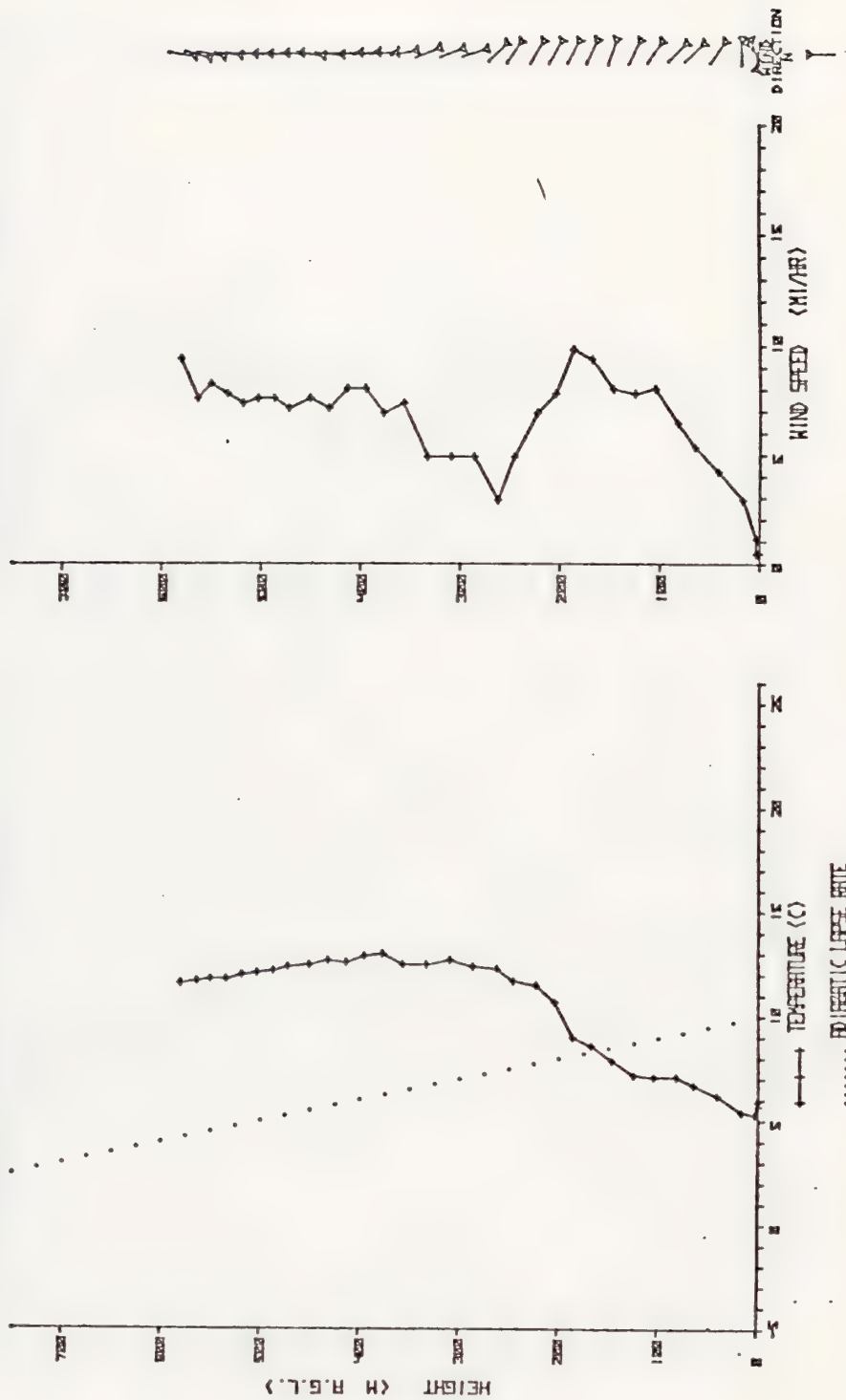
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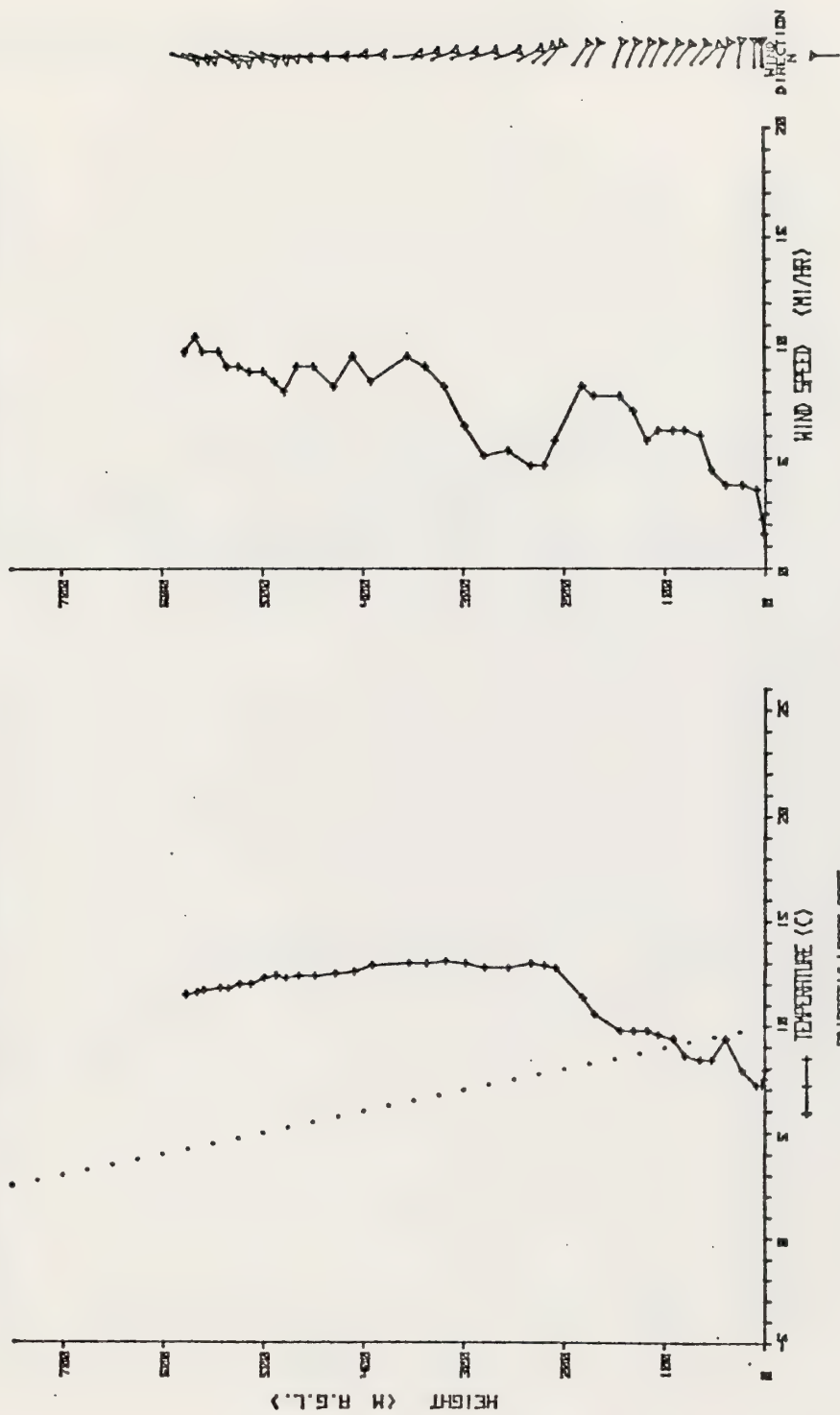
AEROVIRONMENT INC. TETHERBOND

C-8 OIL SPILL DATE 9/15/78 TIME 155



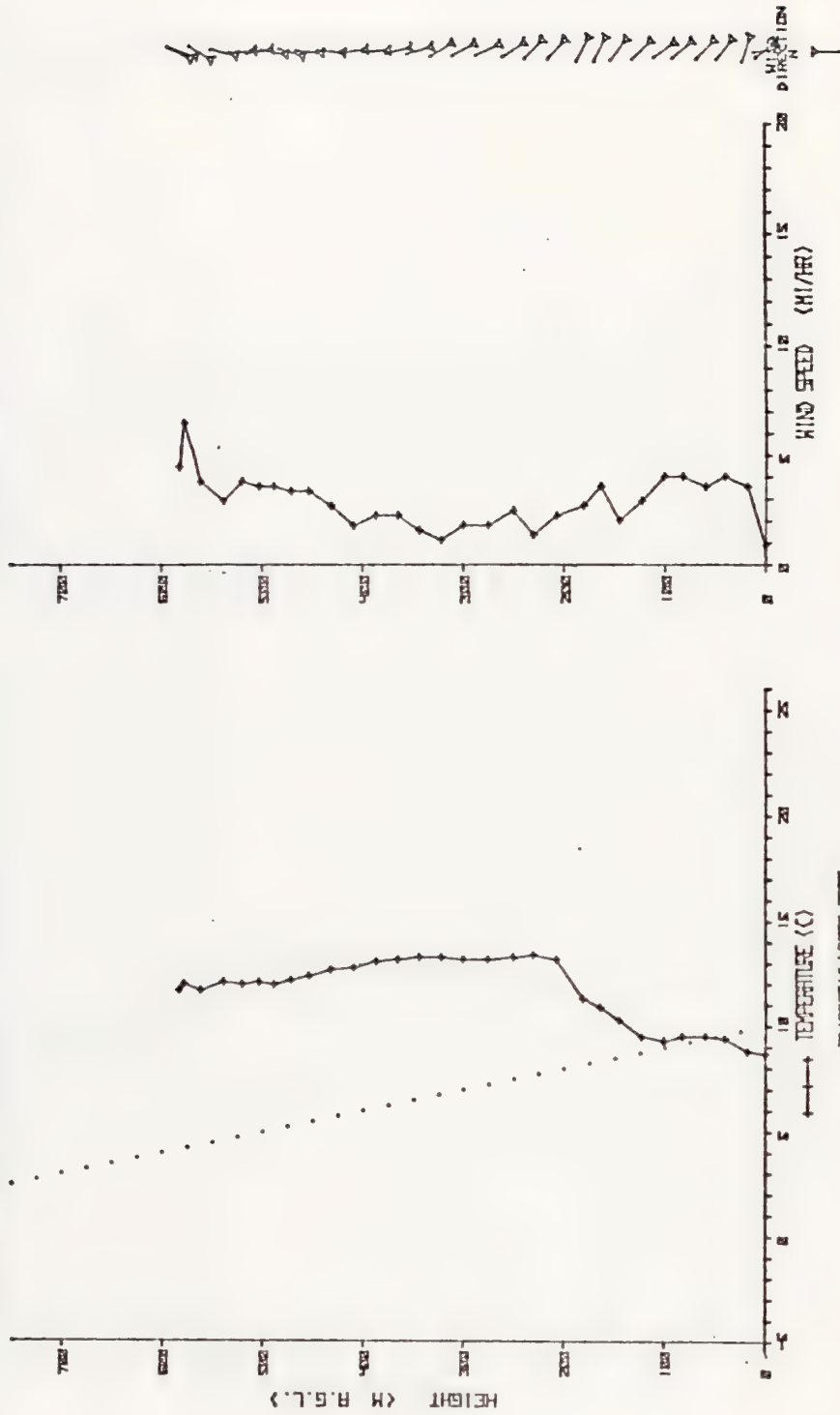
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PEROVIRONMENT INC. TETHERBONDE

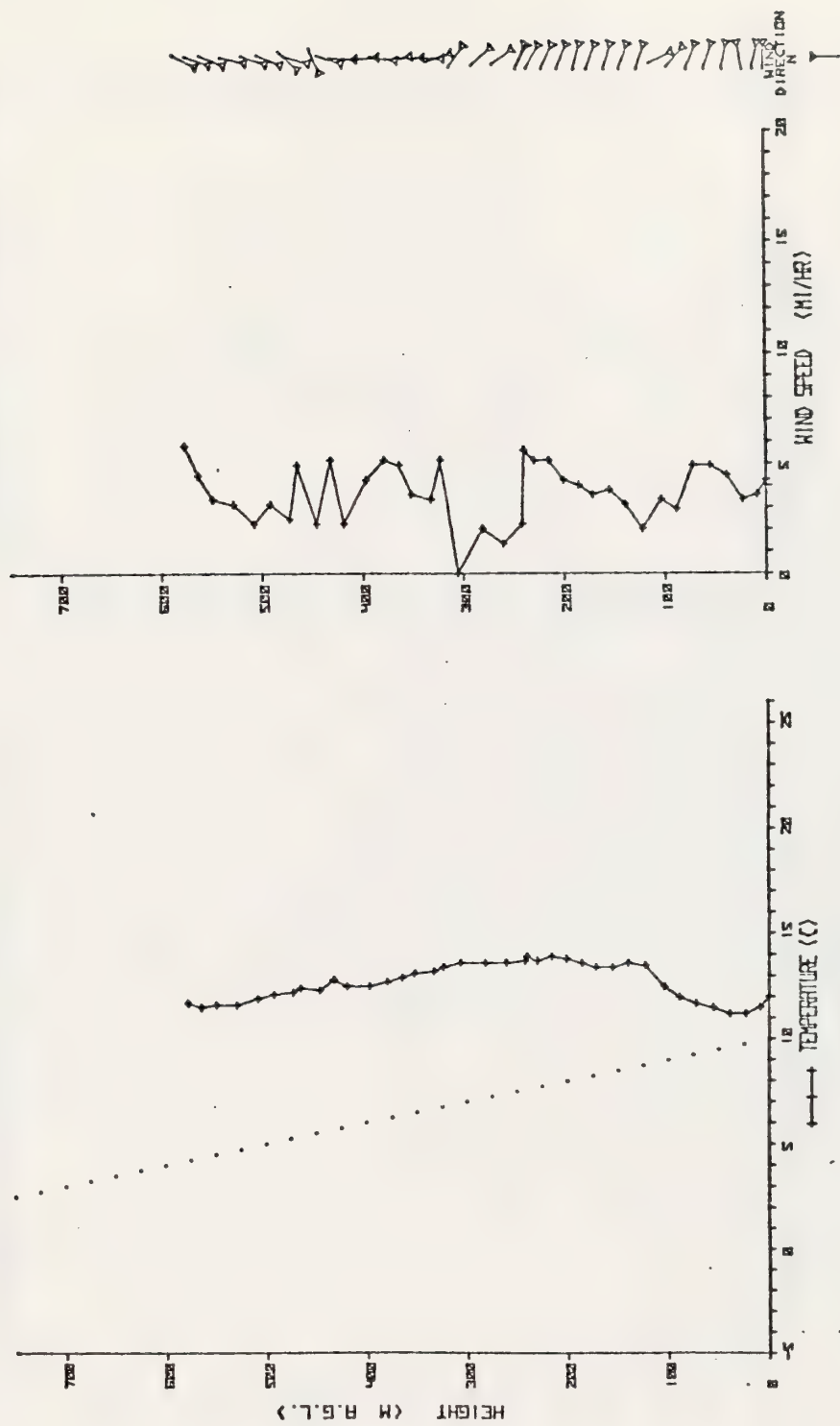
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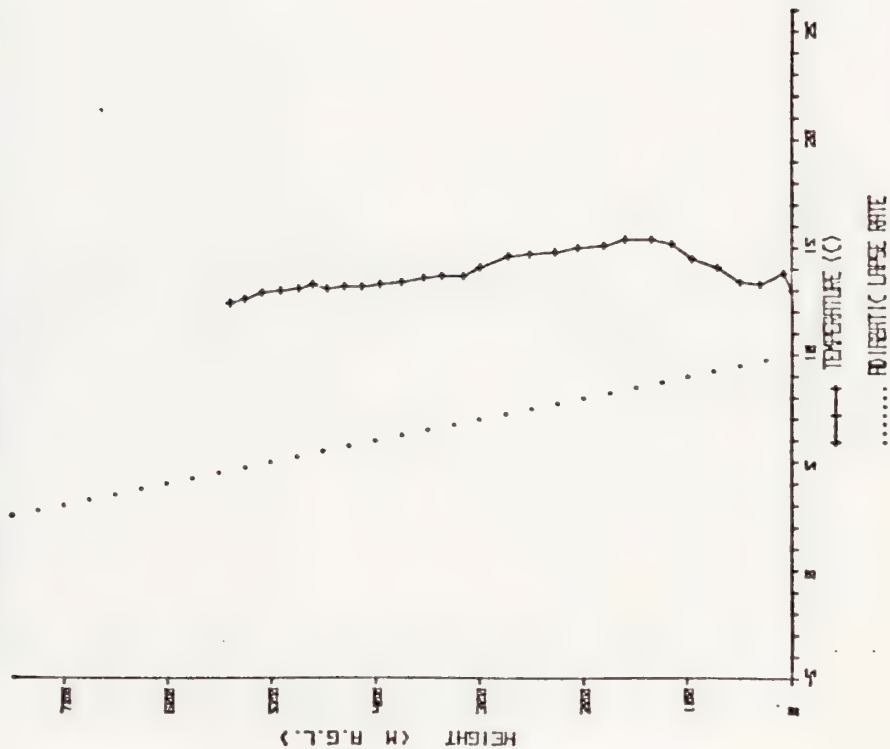
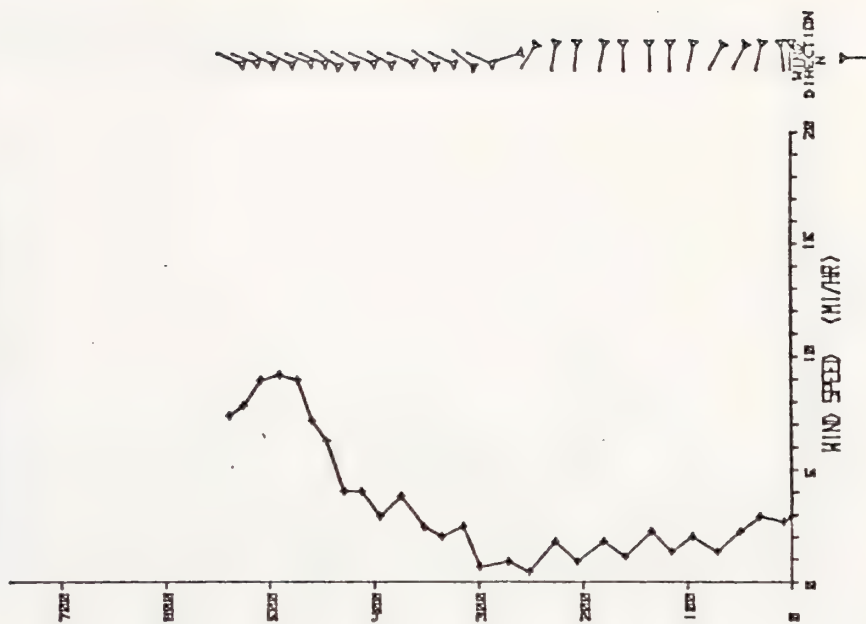
HEROVIROMENT INC. TETHERSONDE

C-B OIL SAMPLE DATE 9/15/78 TIME 614

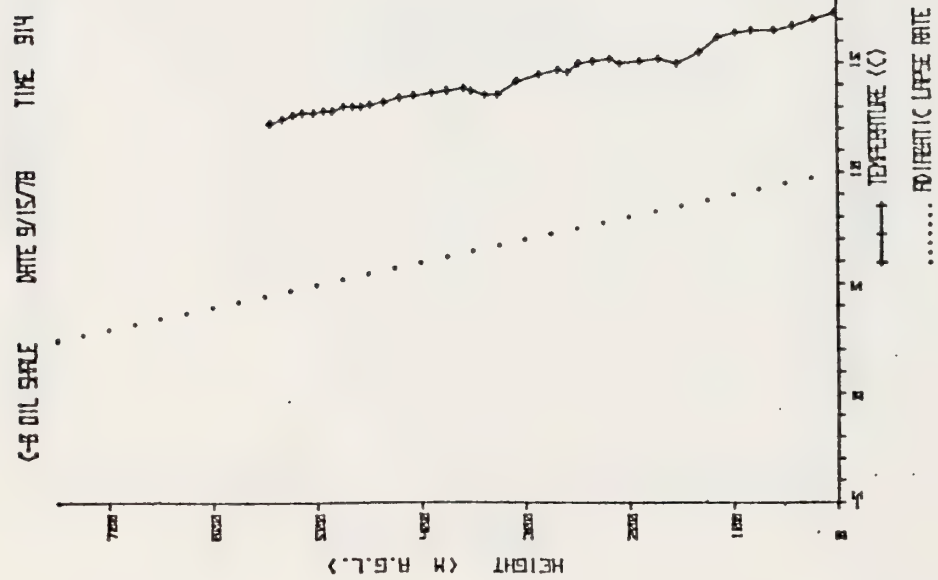
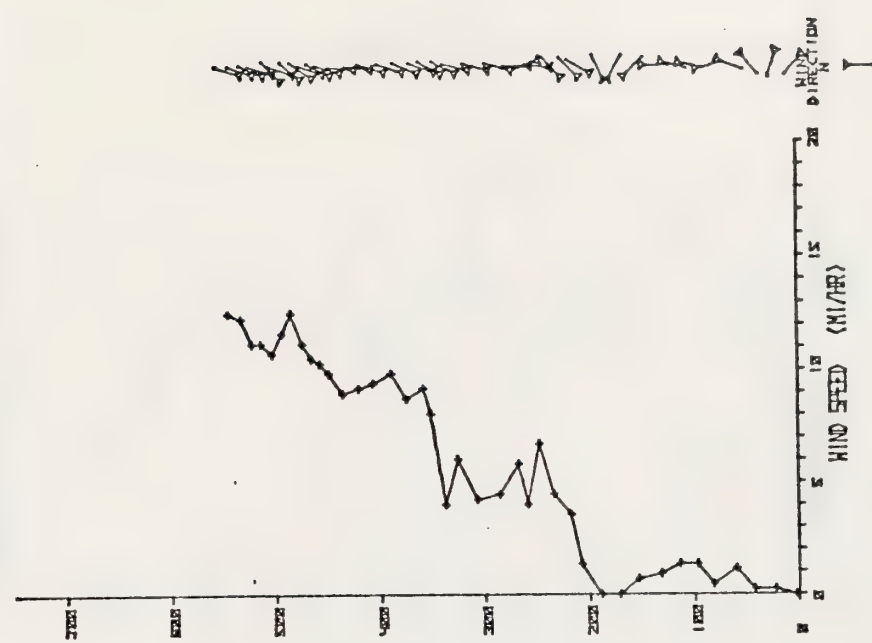


HERO/IRONMENT INC. TETHERSON

DATE 9/15/78 TIME 084



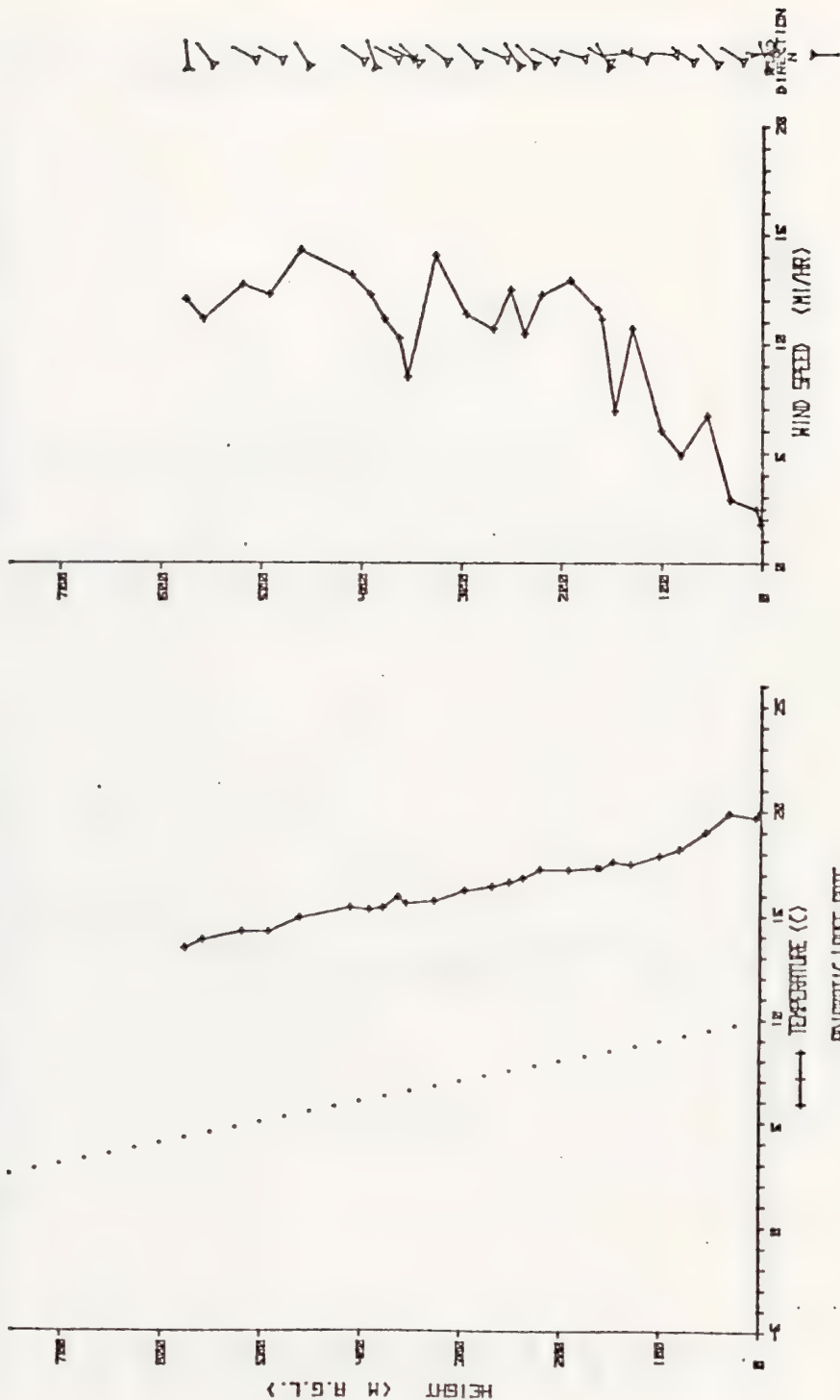
HEROYRMENT INC. TETHERBOMBOE



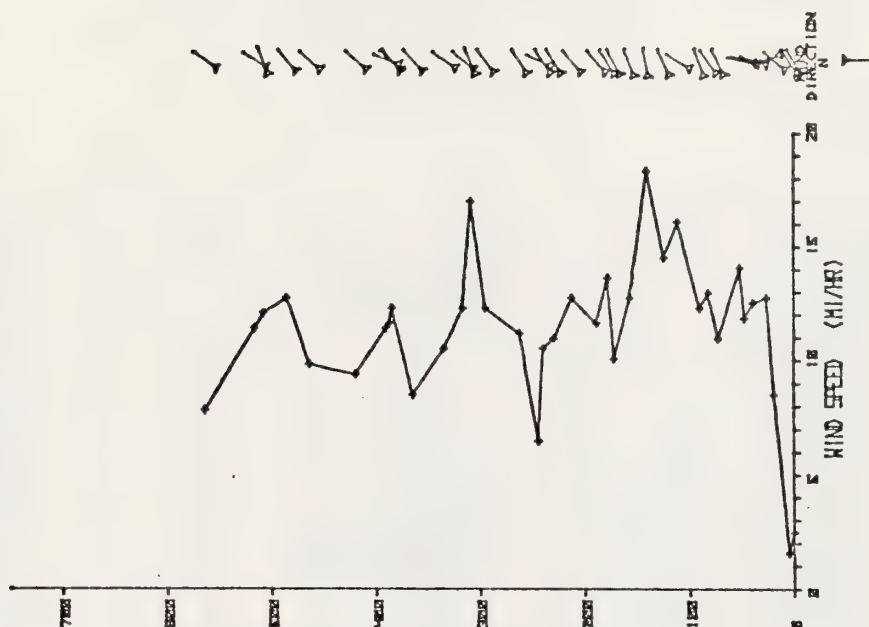


PERVIRONMENT INC. TETHERBOMBE

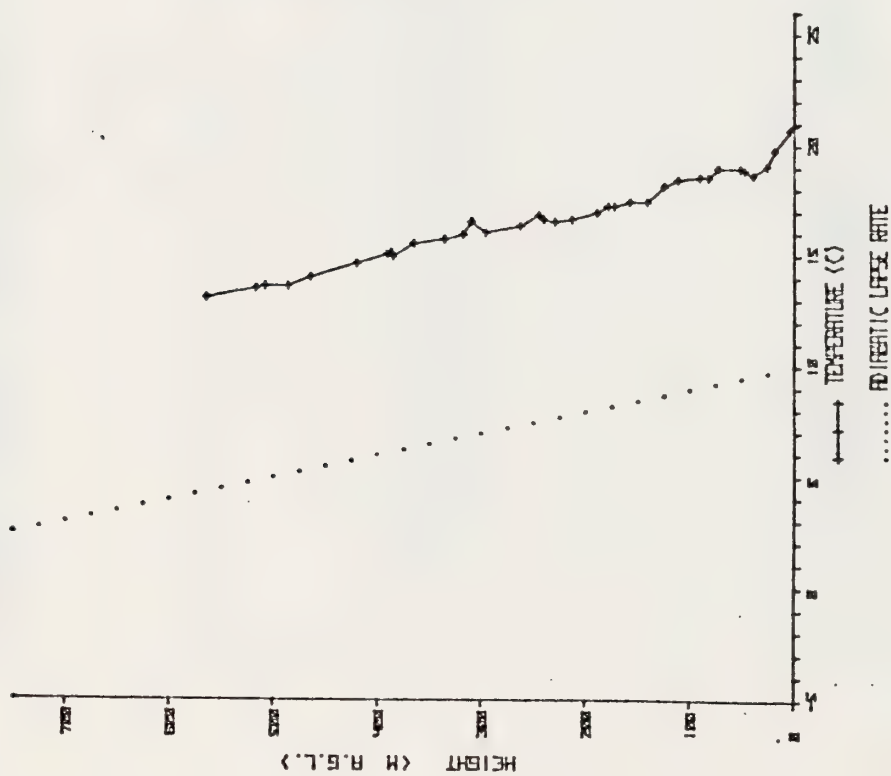
C-B OIL SHALE DATE 9/15/78 TIME 0535



PERVIRONMENT INC. TETHERSONDE



C-8 OIL SHALE DATE 9/15/79 TIME 1015



## APPENDIX B

### Tracer Gas Release Data



TABLE B-1. Release site data, 14 September 1978, release rate 28.8 lbs/hr, height of release approximately 100 m (330 feet).

Time	Cylinder Weight (lbs)	Estimated Wind
0412	279.5	SE
0427	273.0	SE
0442	266.5	S
0458	259.5	ESE
0515	252.5	S
0535	245.0	SW
0545	240.5	SW
0600	235.5	W
0612	230.5	N
0627	224.5	SE
0642	217.5	SE
0657	211.5	SSE
0712	205.0	SSE
0727	199.0	SE
0742	193.5	E
0757	186.0	E
0812	179.5	SE
0827	173.5	ESE
0842	171.5	ESE
0857	263.0	E
0912	256.5	ENE
0927	250.5	E
0942	244.3	ENE
0957	237.4	NNE
1012	231.1	NNE
1027	225.5	ENE
1042	219.5	N
1057	212.5	SW
1100	210.5	S

TABLE B-2. Release site data, 15 September 1978, release rate 28.0 lbs/hr, height of release approximately 100 m (330 feet).

Time	Cylinder Weight (lbs)	Estimated Wind
0400	210.0	SE
0415	203.5	SE
0430	197.0	SE
0445	191.5	E
0500	185.0	ESE
0515	179.0	SE
0530	172.5	SE
0545	166.5	ESE
0600	160.0	ESE
0615	154.0	SE
0630	270.0	SE
0645	263.8	E
0700	258.0	ESE
0715	251.3	SE
0730	245.0	SE
0745	239.1	SE
0800	232.2	SSE
0815	226.0	SE
0830	220.0	SE
0845	213.5	SSE
0900	207.2	S
0915	201.5	S
0930	194.5	NE
0945	188.0	SSW
1000	182.0	SW
1015	176.5	SW
1030	170.2	SSW
1045	164.0	SSW

## APPENDIX C

### Tracer Gas Concentration Data



TABLE C-1. Observed automatic sample data (ppt), 14 September 1978.

Site	Hour				
	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100
1	87	28	1	3	24
2	10	19	207	1,440	1,610
3	629	812	1,256	39	95
4	263	183	8	6	11
5	51	2	2	0	31
6	0	9	48	17	5
7	6	28	51	23	3
8	13	58	52	13	4
9	-	98	78	12	5
10	62	15	-	12	6
11	142	232	49	12	5
12	9	30	9	11	5
13	161	227	4	6	6
14	4	8	3	5	6
15	0	0	1	2	6
16	1,361	1,023	86	6	8
17	7	40	2	5	9
18	0	0	1	2	9
19	1	0	0	0	5
20	1	0	0	0	5
21	0	0	0	2	9
22	0	0	1	1	6
23	2	1	13	210	1,243

TABLE C-2. Observed grab sample data (ppt), 14 September 1978.

Site Number	Time	(ppt) Concentration	Site Number	Time	(ppt) Concentration
1	0600	376	32	0853	20
2	0610	115	33	0901	2647
3	0614	-	34	0903	8
4	0620	64	35	0906	2
5	0626	365	36	0912	2
6	0631	64	37	0915	2
7	0635	22	38	0922	1623
8	0638	8	39	0945	7
9	0640	9	40	1005	121
10	0643	2	41	1023	7
11	0646	6	42	1029	13
12	0726	30	43	1032	11
13	0730	82	44	1032	3244
14	0733	85	45	1035	9
15	0736	125	46	1037	8
16	0738	54	47	1040	8
17	0743	98	48	1040	216
18	0749	1	49	1043	6
19	0754	11	50	1046	5
20	0756	1	51	1048	13
21	0759	3	52	1051	5
22	0803	2	53	1052	14
23	0805	2	54	1053	4
24	0809	2	55	1058	10
25	0815	2	56	1102	4
26	0818	1	57	1108	3
27	0821	1	58	1113	6
28	0825	2	59	1116	7
29	0841	3	60	1119	6
30	0846	55	61	1122	8
31	0849	6			

TABLE C-3. Observed automatic sample data (ppt), 15 September 1978.

Site	Hour				
	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100
1	1	0	0	0	3
2	1	1	3	180	2
3	82	63	26	385	0
4	1	1	1	157	85
5	0	0	0	1	0
6	2	1	1	28	8
7	3	2	2	28	11
8	2	0	1	28	15
9	0	1	1	25	2
10	3	1	2	129	2
11	1	1	2	109	3
12	0	0	1	81	3
13	1	0	0	49	28
14	1	0	0	54	39
15	1	1	1	61	-
16	1	1	0	30	14
17	1	0	1	131	58
18	1	1	2	22	45
19	0	0	0	21	31
20	0	1	1	52	59
21	2	0	1	0	1
22	0	0	1	0	1
23	0	1	1	1	1



TABLE C-4. Observed grab sample data (ppt), 15 September 1978.

Site Number	Time	(ppt) Concentration	Site Number	Time	(ppt) Concentration
1	0643	0	35	0935	2
2	0649	2	36	0939	1
3	0652	19	37	0942	5
4	0655	1	38	0945	17
5	0659	0	39	0948	32
6	0703	3	40	0951	31
7	0713	2	41	0958	20
8	0716	3	42	1000	1
9	0718	3	43	1002	39
10	0724	1	44	1003	1
11	0728	3	45	1005	1
12	0731	1	46	1006	1
13	0734	1	47	1008	1
14	0744	3	48	1010	15
15	0750	2	49	1010	1
16	0750	2	50	1013	1
17	0754	2	51	1013	1
18	0802	0	52	1026	1
19	0815	1	53	1032	1
20	0830	1	54	1035	1
21	0851	0	55	1045	0
22	0854	2	56	1047	1
23	0857	3	57	1050	1
24	0900	1	58	1051	1
25	0900	2	59	1053	34
26	0903	8	60	1104	1
27	0914	2	61	1111	1
28	0916	218	62	1113	0
29	0917	1	63	1118	0
30	0920	16	64	1121	0
31	0923	24	65	1124	2
32	0927	13	66	1127	1
33	0927	6	67	1130	0
34	0932	10			

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## II B-7 PARTICULATE ANALYSIS

The data presented in this section represents the distribution of particle sizes for suspended particulates measured with an Anderson particle sizing head on a standard High Volume sampler. In general, the total particulate catch was too small for accurate size fraction measurement; however, all the data are presented here.

<u>Table/Figure No.</u>	<u>Description</u>	<u>Page No.</u>
Table II B-63	Size distribution of airborne particulate matter in the respirable ranges.	II B-312

Table II B-63  
 SIZE DISTRIBUTION OF AIRBORNE PARTICULATE MATTER  
 IN THE RESPIRABLE RANGES

Concentrations in  $\mu\text{g}/\text{m}^3$

Size Range in Microns* Date of Sample	7.0-Above	3.3-7.0	2.0-3.3	1.1-2.0	0.01-1.1
April 6-7, 1978	0	5.50	0	0.94	4.40
April 24-25, 1978	5.81	0	0	1.26	1.47
April 30- May 1, 1978	7.70	0	1.89	5.81	13.20
May 6-7, 1978	0	0	0	1.10	3.93
May 12-13, 1978	0	0	0	1.89	35.66
May 18-19, 1978	12.57	9.27	8.48	12.41	15.71
May 24-25, 1978	0	0.47	0	0	0
Mean	3.73	2.18	1.48	3.34	12.05

\* Aerodynamic diameter of the particulate matter.

TRACE METALS

INVERSION STUDIES





## II B-8 TRACE METALS

No additional studies were completed during this time period.

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## II B-9 INVERSION STUDIES

Refer to the references at the end of section II B for studies completed during this time period.



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AIR QUALITY  
ASSURANCE

TETHERSONDE  
SOUNDINGS





II B-10 TETHERSONDE SOUNDINGS

Refer to the references at the end of section II B for studies completed during this time period.

AIR QUALITY  
ASSURANCE

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II B-11 AIR QUALITY ASSURANCE

QUALITY ASSURANCE PLAN

FOR

AIR RESOURCES MONITORING,

OIL SHALE LEASE TRACT C-b

Prepared for

C-b Oil Shale Venture

2572 G Road

P.O. Box 2687

Grand Junction, Colorado 81501

By

AeroVironment Inc.

145 Vista Avenue

Pasadena, California 91107

June 1978

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2. ORGANIZATION AND RESPONSIBILITY
3. PROJECT QUALITY ASSURANCE PROGRAM
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- B Excerpt from AeroVironment's Data Reduction Manual
- C AeroVironment's Calibration Records
- D AeroVironment Daily Check List
- E AeroVironment Data Quality Control Chart
- F Instrument Status Report Form



## 1. PROJECT DESCRIPTION

The current air quality and meteorology measurement program on Federal Prototype Oil Shale Lease Tract C-b near Rio Blanco, Colorado, is being performed to comply with the lease agreements between the C-b Shale Oil Venture and the U.S. Department of the Interior, as well as with the additional conditions imposed by the Area Oil Shale Supervisor. The air quality and meteorological monitoring network is being operated to comply with these tract lease terms, and to generate data of adequate quality to meet the regulatory requirements of the U.S. Environmental Protection Agency and the Air Pollution Control Division of the Colorado Department of Health. The air quality parameters being monitored include sulfur dioxide, hydrogen sulfide, carbon monoxide, ozone, oxides of nitrogen, nitric oxide, nitrogen dioxide, and total suspended particulates, while the meteorological parameters include wind speed and direction, temperature, lapse rate, relative humidity, barometric pressure, solar radiation, atmospheric mixing height, turbulence, precipitation and evaporation.

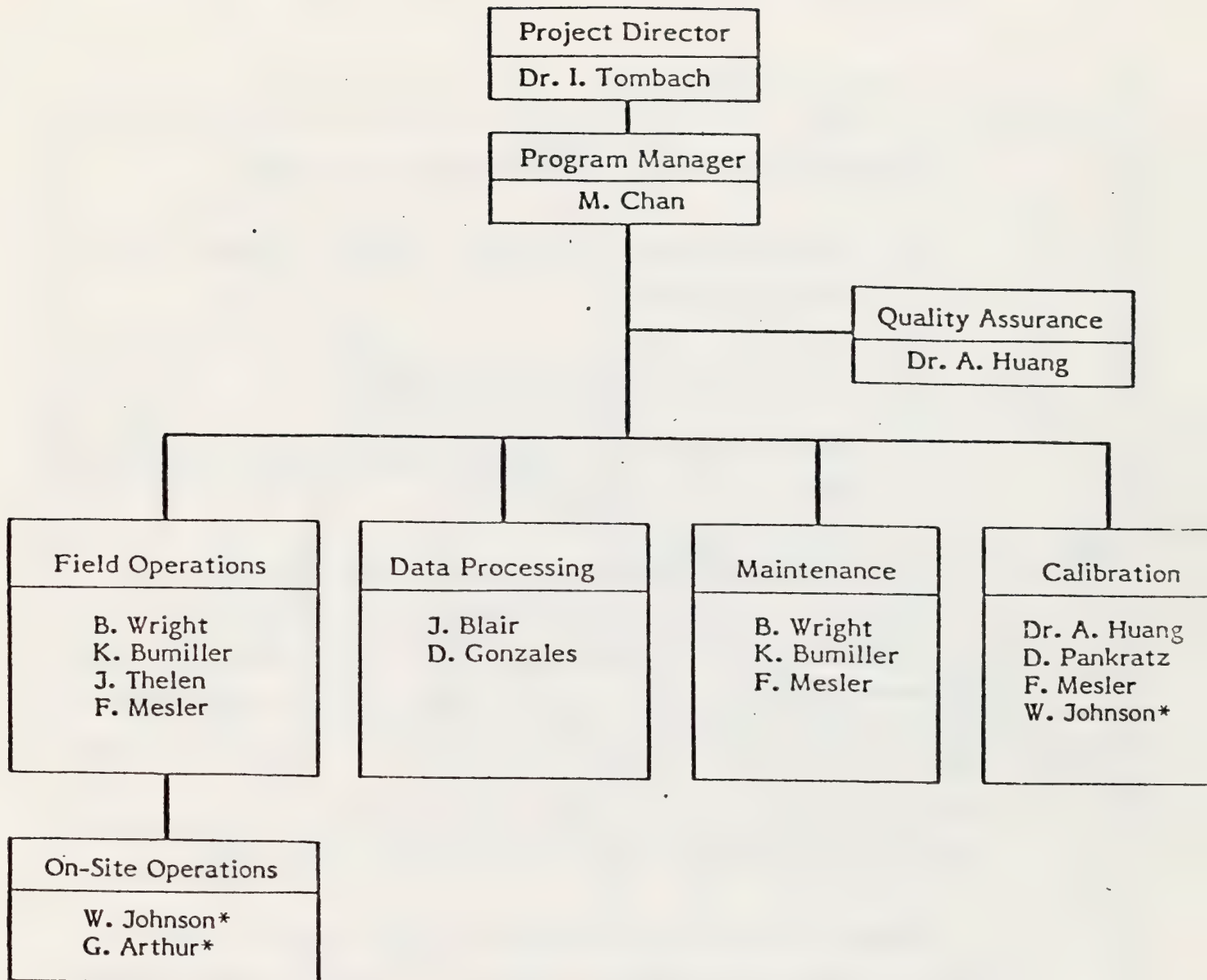
AeroVironment (AV) is responsible for the design, operation, maintenance and calibration of such a program, and for reduction of the data generated by the network. Day-by-day station checks will be conducted by Occidental Oil Shale, Inc. personnel following procedures established by AV.

## 2. ORGANIZATION AND RESPONSIBILITY

Corporate level management for AeroVironment's activities on the C-b Tract is provided by Dr. Ivar Tombach, AeroVironment's Vice President, Environmental Programs. Technical and project management is the responsibility of Mr. Michael Chan, Manager of Air Quality Studies.

The quality assurance aspects of the project are supervised by Dr. Andrew Huang, who is in charge of calibration. Mr. Bruce Wright, Manager of Field Operations is responsible for the operation and maintenance of the monitoring equipment, and Mr. John Blair, Manager of Data Processing, for the data reduction. Daily station checks are performed by Occidental personnel.

An organization chart for the quality assurance portions of the project is presented in Figure 2-1.



\*Occident Oil Shale, Inc. employee

FIGURE 2-1. Project quality assurance organization chart.



### 3. PROJECT QUALITY ASSURANCE PROGRAM

Quality assurance is an integral part of a project. In this section, detailed procedures for each quality assurance element considered essential to the project are presented.

#### 3.1 Monitoring Site Selection

Monitoring site selection criteria included the following:

- a) No obstructions between the potential sources and the monitoring points;
- b) No interference from other local sources;
- c) Potential maximum air pollution impact for future development; and
- d) Representativeness of area-wide air quality and meteorology.

Potential air contaminant sources in the C-b tract have been documented in a publication entitled "Oil Shale Tract C-b Modifications to Detailed Development Plan," submitted by Ashland Oil, Inc., and Occidental Oil Shale, Inc. to the Area Oil Shale Supervisor in February 1977. The current monitoring network has been designed according to that document, taking into consideration the existing baseline monitoring network.

Figure 3-1 illustrates the monitoring sites selected. As indicated, there are four monitoring stations, Sites 020, 023, 042, and 056. A station operational schedule which includes the air quality and meteorological parameters involved is presented in Table 3-1.

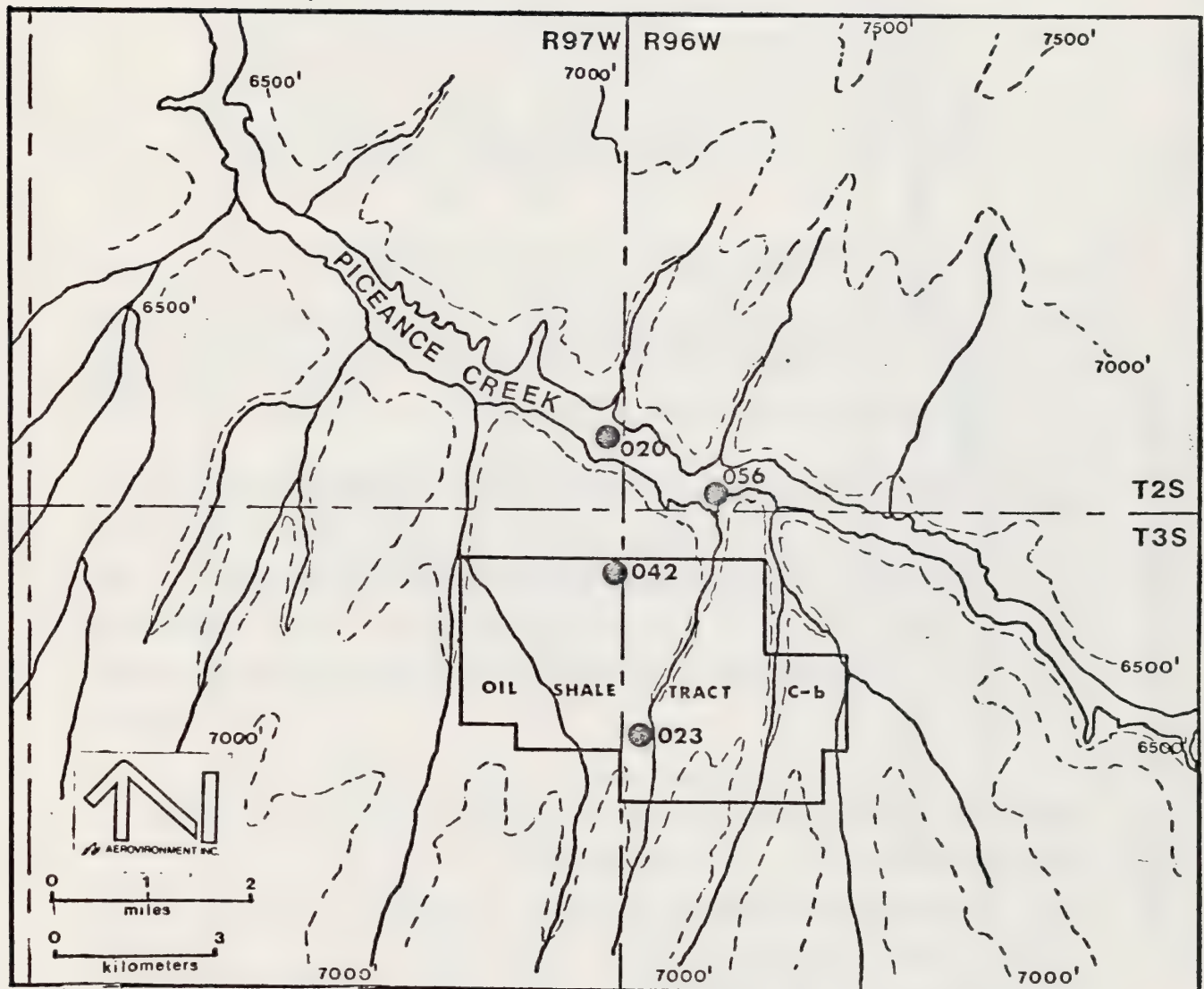


FIGURE 3-1. Air Quality and Meteorology Monitoring Locations

TABLE 3-1. Station Operational Schedule.

Site	Start-up Date	SO <sub>2</sub>	H <sub>2</sub> S	CO	O <sub>3</sub>	NO/NO <sub>x</sub> /NO <sub>2</sub>	TSP	Met.	Mixing & Inversion Heights	Remarks
020	(a) 10/30/77							X		
	(b) 11/17/77						X		X	
	(c) 1/20/78									
	(d) 6/1/78			X	X	X				
	(e) 6/79	X	X							
023	Operational	X	X	X	X	X	X	X		60m Met. tower
042	(a) 1/18/78							X		
	(b) 2/1/78						X			
056	(a) 1/19/78							X		
	(b) 2/4/78						X			

### 3.2 Monitoring Equipment and Procedure

An amendment to Federal Register Section 51.17a "Air Quality Monitoring Methods" (Federal Register, Vol. 41, No. 232, Wednesday, December 1, 1976) stated that:

(2) Any analyzer for SO<sub>2</sub>, CO, or photochemical oxidant purchased before February 18, 1976, may be used for purposes of 51.17 (a) up to and including February 18, 1980. Any analyzer for NO<sub>2</sub> purchased prior to 1 year after date of promulgation of these amendments may be used for purposes of 51.17(a) for a period not to exceed three years after date of promulgation of these amendments. "

Therefore, for the on-going Cb project, it is required by the EPA that the monitoring instruments for SO<sub>2</sub>, CO, and O<sub>3</sub> be converted to the instruments which EPA designates as reference or equivalent methods by February 18, 1980. The equivalent date for instruments for NO<sub>2</sub> is December 1, 1979.

Accordingly, AeroVironment utilizes the presently existing equipment as much as possible and, as appropriate, plans to convert the equipment in order to comply with the rules and regulations set forth by the EPA. Table 3-2 presents a list of equipment being used or to be used at the four different monitoring sites. Manufacturers' specifications are included in Appendix A.

All of the parameters of interest are monitored continuously except for TSP, which is measured at three-day intervals. The output from the instruments will be recorded by use of a Monitor Labs Model 9300 data acquisition system and backed up by an Esterline Angus Model E1124 E multipoint chart recorder at each of the 020, and 023 sites. At present, only EA multipoint chart recorders are used as primary recording means.

Data will be scanned using the data acquisition system at 10-second intervals. The 5-minute averages or 5-minute average r.m.s. values as calculated from the scanned data are then recorded on magnetic tapes. The



TABLE 3-2. Monitoring Equipment List.

Site	Parameter	Instrument	Principle of Operation	EPA Designated Instrument
020 (10 m tower)	SO <sub>2</sub>	Meloy SA 185-2 w/H <sub>2</sub> S scrubber	FPD	No
	H <sub>2</sub> S	Meloy SA 185-2 w/SO <sub>x</sub> scrubber	FPD	NA
	THC/CH <sub>4</sub>	Bendix 8200	GC-FID	NA
	CO	Bendix 8200	GC-FID	No
	O <sub>3</sub>	Meloy OA 350-2	Chemiluminescent	No
	NO/NO <sub>x</sub> /NO <sub>2</sub>	Monitor Labs 8440E	Chemiluminescent	Yes
	TSP	General Metal Works GMWL-2000H	Hi-Vol Sampling	NA
	Wind speed/wind direction	WeatherMeasure W 1034	-	-
	Temperature	WeatherMeasure T621-TP18X	-	-
	Mixing height, inversion height	AeroVironment 300A	Acoustic radar	-

TABLE 3-2. (continued)

Site	Parameter	Instrument	Principle of Operation	EPA Designated Instrument
023 (60 m tower)	SO <sub>2</sub>	Meloy SA 185-2A	FPD	Yes
	H <sub>2</sub> S	Meloy SA 185-2 with SO <sub>x</sub> scrubber	FPD	NA
	CO	Bendix 8200	GC-FID	No
	O <sub>3</sub>	Meloy OA 350-2	Chemiluminescent	No
	NO/NO <sub>x</sub> /NO <sub>2</sub>	Monitor Labs 8440E	Chemiluminescent	Yes
	TSP	General Metal Works 2000H	Hi-Vol Sampling	NA
	Wind speed/wind direction at 10m, 30m, and 60m	MRI 1074-2	-	-
	Temperature at 10m, 30m, and 60m	MRI 840	-	-
	Delta temperature 10m-60m	MRI 840	-	-
	$\sigma_{\theta}$ at 10m and 60m	MRI 1074-2 and Sigma Processor	-	-
	$\sigma_w$ at 10m and 60m	R. M. Young 27103 Gill Anemometer	-	-
	Relative Humidity at ~1.5m	WeatherMeasure H324-S	Hair Hygrograph	-

TABLE 3-2. (continued)

Site	Parameter	Instrument	Principle of Operation	EPA Designated Instrument
023 (continued)	Barometric pressure	Weather Measure B 242	-	-
	Solar radiation	Eppley Spectral Pyranometer	-	-
042	TSP	General Metal Works 2000H	Hi-Vol Sampling	NA
	Wind speed/wind direction	MRI 1071	-	-
	Temperature	MRI 1071	-	-
056	TSP	General Metal Works 2000H	Hi-Vol Sampling	NA
	Wind speed/wind direction	MRI 1071	-	-
	Temperature	MRI 1071	-	-

5-minute and/or scanned values can be printed in tabular form on a printer on demand at each of these stations. The back-up EA chart recorder logs data at 2-1/2-minute intervals. At Sites 042 and 056, integral strip chart recorders are used to monitor the meteorological parameters. As for TSP, a Dickon recorder is used to record the high volume sampling flow rate throughout the 24-hour sampling period.

An environmentally controlled shelter is provided at Sites 020, and 023 to meet the instrument manufacturers' requirements. The equipment used at Sites 042 and 056 requires no environmental control.

### 3.3 Data Reporting

Data collected on magnetic tapes and strip charts will be reduced to obtain hourly averages of all parameters. One-hour statistical description of wind and turbulence will also be calculated. Calibration factors obtained during calibrations are then applied to arrive at final data.

AeroVironment will provide computer-printed tables of hour-by-hour averages for each month, except for TSP which will be given for 24-hour sampling periods.

#### o Raw Data Reduction Procedure

Data gathered on the magnetic tapes is compiled by computer to arrive at hourly averages of the parameters of interest. In the case of strip charts, in general the data is manually digitized, using a computer digitizer, to obtain hourly averages. In a few cases, manual strip chart reduction procedures will be used. The raw data thus derived are recorded on magnetic tape and are printed on appropriate data forms, together with other information on instrument status, such as times of calibration, maintenance, instrument malfunction, etc. Pertinent sections of AeroVironment's data reduction procedure are included in Appendix B.



o Data Calculation Procedure

The zero and span sources whose values are determined at the monthly multipoint calibration (see Section 3.5) are fed into the respective instruments daily, and the instrument responses recorded. The calibration factors are calculated based on these data, and they are applied to the monitored data for the next 24 hours or until the next zero and span checks occur. This approach insures that the instrument drift problems are adjusted on a daily basis.

Occasionally the instrument zero and span checks would give values which exceed control limits established (see Section 3.6 and Appendix E). This might be caused by excessive instrument drifts and/or unstable calibration sources. (In this case, the instruments will have to be readjusted or calibration sources replaced as soon as this kind of problem is detected during a daily station check.) The concept of extending one set of calibration factors over the next 24 hours would not give correct data. Under these circumstances, the data from the computer output is further calibrated by AV by use of the linear interpolation of the two sets of calibration factors over the intervals concerned. The calculations are handled by the AV in-house computer.

3.4 Data Validation

As noted before, the data system logs data once each five minutes, giving 12 values per hour. An hour of data is considered valid if it includes six 5-minute periods; i.e. this allows 6 values to define an hour. Strip chart data is considered to represent the hour if more than 30-minutes of the record is valid.

Data collected in the first 15 minutes after calibration is generally discarded. Data is considered erroneous if any of the status indications or the station log suggest instrument malfunctioning. In addition, air quality data collected in the first 15 minutes after a brief power outage (less than 10 minutes), in the first hour after a medium duration outage (up to one

hour), or in the first four hours after longer outages, will be discarded as unreliable. Any anomalous data reflecting signal spikes or dropouts with a response rate faster than ascribable to atmospheric phenomena (e.g., a tripling of  $\text{NO}_x$  levels from one scan to the next, followed by a return to the old level on the succeeding scan) will be deleted as an artifice caused by the system.

As an additional check, the calibrated data is also screened manually. First, data is scanned to detect extreme values. When a spurious value is located, it will be checked for its validity. In all cases when invalidated data is deleted, a record of these deletions is maintained. Only the validated data is reported.

### 3.5 Calibration

Monthly multipoint calibrations of all air quality instruments are performed. Calibration of air quality instruments was carried out at the start of the project, and monthly thereafter by AV. The purpose of the monthly calibration is two-fold: 1) to check the instrument linearity and, 2) to assign the values of the on-site calibration sources so that they are NBS traceable. For meteorological equipment, off-site calibration was done in the first three months, and calibration checks are performed quarterly thereafter by AV. Table 3-3 presents the schedule for calibrations.

#### o Methodology

The air quality instruments for  $\text{SO}_2$ ,  $\text{H}_2\text{S}$ ,  $\text{O}_3$ , and  $\text{NO}/\text{NO}_x$  will be dynamically calibrated by use of a Monitor Labs Model 8500 Dynamic Calibration System. This calibrator utilizes the permeation principle for  $\text{SO}_2$  and  $\text{H}_2\text{S}$ , ozonation of air for ozone, and dilution of concentrated NO to ambient level NO, and can perform gas phase titration of NO and  $\text{O}_3$  for  $\text{NO}_2$  calibrations. It is capable of producing stable concentrations for the purpose of calibration of the instruments. For the CO instruments, three cylinders of gases containing approximately 0, 4, and 8 ppm of CO are used to calibrate the analyzers.

Instrument linearity will be established by multi-point calibration. AV calibration record forms are included in Appendix C.

The calibrator's SO<sub>2</sub> permeation tube output is calibrated quarterly by using the EPA-prescribed pararosaniline method (Federal Register, Vol. 36, No. 84, Part II, April 30, 1971); H<sub>2</sub>S output by the cadmium hydroxide stractan method (Intersociety Committee, American Public Health Association, Washington, D.C., 1972); and O<sub>3</sub> output by the EPA prescribed 1% neutral buffered potassium iodide (NBKI) method (Federal Register, ibid). The concentrated NO cylinder used (~100 ppm) is NBS traceable, and the traceability is maintained by re-analyzing the cylinder once every six months by using an NBS cylinder. The dilution system of the calibrator is checked once every three months by using an NBS traceable test meter. The NO dilution output from the calibrator is further calibrated quarterly by use of the Saltzman method (Intersociety Committee, ibid).

Cylinders used to calibrate the CO instrument are NBS traceable. The traceability is maintained by re-analyzing the cylinders once every six months by using an NBS cylinder.

The high volume sampler is calibrated monthly by use of a set of resistance plates which in turn, is calibrated by using an NBS traceable Roots Meter once a year. The balance used for weighing glass fiber filters is calibrated quarterly by using a set of NBS traceable weights.

Consistency checks are made for all the calibration results on the AV transfer standards, namely the Monitor Labs Calibration System and CO cylinders. The emphasis of the quality assurance program is to establish an unbroken chain of traceability of the reported data to the EPA reference methods or NBS standards.

Calibration of some of the meteorological equipment is done off-site as indicated in Table 3-3. Detailed calibration schedule is presented in Table 3-4. The wind sensors are calibrated by use of an NBS traceable wind tunnel, the temperature sensors by use of an NBS traceable thermometer,




























TABLE 3-3. Calibration and maintenance schedule.

	1977			1978								
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<u>Air Quality Instruments</u>												
AV Calib. & Maintenance	▲			▲			▲			▲		
Field Operator calibration & Maintenance		▲	▲		▲			▲	▲		▲	
<u>Meteorological Instruments</u>												
Off-site Calibration												
Calibration Check and maintenance				▲			▲			▲		
<u>Calibration System</u>												
AV Calibration	▲											
<u>Analytical Balance</u>												
AV Calibration				▲			▲					



TABLE 3-4. Meteorological Equipment Calibration Schedule

Site	Parameter	Instrument	Month, 1978				
			Apr	May	Jun	Jul	Aug
020	WS/WD T	Weathermeasure W1034 WeatherMeasure T621-TP18X		 			
023	WS/WD at 10m WS/WD at 30m WS/WD at 60m T at 10m T at 30m T at 60m $\Delta T$ (60m-10m) $\sigma_w$ at 10m $\sigma_w$ at 60m $\sigma_\theta$ at 10m $\sigma_\theta$ at 30m $\sigma_\theta$ at 60m Relative Humidity Barometric pressure Solar radiation	MRI 1074-2 MRI 1074-2 MRI 1074-2 MRI 840 MRI 840 MRI 840 MRI 840 R.M. Young 27103 Gill Propeller Anemometer R.M. Young 27103 Gill Propeller Anemometer MRI 1074-2 MRI 1074-2 MRI 1074-2 WeatherMeasure H324-S WeatherMeasure B242 Eppley Precision Spectral Pyranometer	                       				

and the pressure sensors by use of an NBS traceable barometer. The accuracy of the methods will be traceable to NBS standards when applicable.

### 3.6 Station Check

Station checks are performed daily by the C-b Shale Oil Venture personnel following the procedure established by AV and using the Daily Check List form, as provided in Appendix D. The main concerns here are to insure that the analyzers and the supporting equipment are in proper working condition.

Zero and span are checked for the analyzers during the station check. For  $\text{SO}_2$ ,  $\text{H}_2\text{S}$ ,  $\text{O}_3$ , and  $\text{NO}/\text{NO}_x$  instruments, this is accomplished by use of the on-site Meloy RAD-1 calibrators which operate on the same principle as the Monitor Labs 8500 (Section 3.5) except that they produce only one concentration for each of  $\text{SO}_2$ ,  $\text{O}_3$  and  $\text{NO}$ . ( $\text{H}_2\text{S}$  analyzer is checked by input of  $\text{SO}_2$ ). For  $\text{CO}$ , a hydrocarbon-free air cylinder and a span cylinder containing approximately 8 ppm of  $\text{CO}$  are used.

The zero and span values for each instrument will be used to create control charts, guidelines for which have been described ("Quality Assurance Handbook for Air Pollution Measurement Systems, Vol. 1 - Principles," EPA-600/9-76-005, 1976). The control charts will be a useful tool to detect early instrumental problems. Appendix E gives the AV Control Chart form.

Any instrument problems are reported by the station check personnel to AV on the same day so that corrective action can be initiated as soon as possible. In addition, an instrument station report is provided weekly by the station check personnel to AV. Appendix F shows the AV instrument status report form.

### 3.7 Preventive Maintenance

Maintenance procedures and schedules are in accordance with the manufacturer's instructions and AeroVironment's experience with the

instruments. A schedule for routine maintenance required to insure proper data collection by the instruments is shown in Table 3-5. Major preventive maintenance is performed quarterly as shown in Table 3-3.

### 3.8 Audits/Interlaboratory Tests

This project will continue to participate in the Western Energy Quality Assurance Program sponsored by EPA to establish data credibility. The frequency of this audit is approximately once every three months. A report is provided by the EPA after each audit. Should a discrepancy exist which warrants further investigation, it will be so recommended in order to resolve the differences.

AeroVironment participates in various continuing interlaboratory comparison programs, as part of its own internal QA program. Of particular interest here is AV involvement in the Ambient Sulfur Dioxide Cross Reference and Atmospheric Air Monitoring Cross Reference Services of Scott Environmental Technology, Inc., Plumsteadville, Pennsylvania. The C-b project benefits from this, since the calibrations of all AV operated programs are cross-correlated with each other at all times.

### 3.9 Spare Provisions Policy

For the air quality instruments, it will be a goal that a back-up instrument be available for each of the significant air quality parameters measured. The back-up instrument is to be in working condition at all times so that it can replace a like malfunctioning instrument, or a circuit card or component can be removed from it to repair an on-site instrument. The resulting non-operating instrument can then be repaired at a more leisurely pace, without the pressure of loss of data. An additional stock of certain key parts, such as pumps, valves, motors, and lamps, will also be maintained. The meteorological equipment requires spare parts, such as wind cups, wind vanes, and circuit cards. Complete spare systems usually are not needed here. In addition, spares for the calibration systems, balances, and data acquisition systems will be maintained. Table 3-6 is a list of recommended spare parts to be maintained.



TABLE 3-5. Instrumentation check and preventive service intervals

Interval	Service
Daily	<p>Check span, zero and flows for all analyzers; adjust and recalibrate if necessary</p> <p>Check relative humidity and barometric pressure readings</p> <p>Check data system clock date and time; reset if necessary</p>
2 weeks	<p>Change membrane filter on O<sub>3</sub> analyzer sample line</p>
1 month	<p>Change membrane filter on NO/NO<sub>x</sub> and GC analyzer sample lines</p>
3 months	<p>Replace glass wool in sample cane</p> <p>Replace hi-vol sampler motor brushes</p> <p>Reset data system attenuators and correlate with analyzer meters</p> <p>Check operation of anemometers and alignment of vanes</p> <p>Check calibration of temperature and <math>\Delta T</math> sensors</p>
6 months	<p>Clean and vacuum test sampling manifold</p> <p>Inspect pump diaphragms in analyzers; replace if necessary</p>



TABLE 3-6. Recommended Equipment Spare Parts

<u>Equipment</u>	<u>Spare Part Description</u>	<u>Part No.</u>	<u>Quantity</u>
<u>Air Quality</u>			
Meloy SA 185-2A Sulfur Analyzer	Complete analyzer	--	1
	Flow capillary	S 900113	6
	Hydrogen regulator	S 900425	4
	Septum	S 90023	8
	Dilution orifice	S 90024	8
	Sample pump	S 900016	4
	Optical window	S 20066	8
	Heat shield window	S 900121	8
	H <sub>2</sub> S scrubber	S 001072	2
	SO <sub>x</sub> -2 scrubber	N/A	2
	Gelman charcoal filter	N/A	8
Bendix 8200 Environmental Chromatograph	Complete analyzer	--	1
Meloy OA350-2 Ozone Analyzer	Complete analyzer	--	1
	Amplifier	S 200197	1
	Critical orifice assembly	S 000609	1
	Sample pump	S 900089	1
	Dilution air orifice	S 900229	5
	Dilution air septum	S 900230	1
Monitor Labs 8440E NO/NO <sub>x</sub> Analyzer	Complete analyzer	--	1
	Mixer board assembly	84000083	1
	Chopper motor and capacitor	2588	1
	Drive belt	2-049	10
	Drive belt	2-042	10
	Charcoal scrubber	12001	10
	Pump diaphragm	80608148	10
	Sample pump	N/A	1
GMWL-2000H Hi-Vol Sampler	Motor	N/A	1
	Motor Brush	N/A	2
	Transformer	N/A	1
	Complete sampler	--	1

TABLE 3-6. (continued)

<u>Equipment</u>	<u>Spare Part Description</u>	<u>Part No.</u>	<u>Quantity</u>
<u>Meteorological</u>			
WeatherMeasure W1034 Wind Sensor	Complete system	--	1
	Wind cup	Type 3L	1
	Wind vane	W104-V	1
MRI 1074-2 Wind Sensor	Complete 1074 head	1074-2	1
	Wind cup	N/A	1
	Wind vane	N/A	1
	Wind speed tach card	12905	1
	540° azimuth card	14303	1
WeatherMeasure T621-TP18X Temperature Sensor	Complete system	--	1
MRI 840 Temperature and $\Delta T$ system	MRI 840-1	N/A	1
	Temperature amplifier card	13495	1
	MRI 840 series $\Delta T$ probe set	N/A	1
	$\Delta T$ amplifier card	17090-1	1
R.M. Young 27103 Prop. Anemometer	Complete set	--	1
R.M. Young 21003 Prop. Bivane	Complete set	--	1
MRI 1071 Mechanical Weather Station	Complete set	--	1
WeatherMeasure H324-S Hair Hydrograph	Hair bundle	H324-HB	1
AV 300A Acoustic Radar	Basic spare parts kit	--	1

### 3.10 Training

Permanent on-site personnel consists of a station operator and an instrument technician, both of whom are employees of the C-b Shale Oil Venture. AeroVironment is responsible for the training of these individuals. In general, training will be provided in the following areas:

- o Station operation and checking
- o Instrument maintenance
- o Instrument repair
- o Instrument calibration
- o Record keeping
- o Data reduction
- o Minisonde and theodolite operation.

The training approaches vary from one area to the next, and include:

- o Formal classroom training on equipment servicing, by manufacturers of equipment used on the tract.
- o On-the-job training, while working in parallel with the AV staff.
- o On-site instruction and practice, with AV technical staff as instructors, in such areas as station checks, instrument calibration, and minisonde launching.

The AeroVironment staff involved with the project is familiar with all aspects of air monitoring system operation, and will itself require no further

training except for familiarization with some of the specific models of instruments used on the C-b tract.

### 3.11 Others

- o Hi-vol filter weighing procedure:
  1. Filters should be inspected against light for pinholes; discard the ones with pinholes.
  2. Install filters in a drying cabinet for at least 24 hours to condition. Make sure that the desiccant (Drierite) inside the cabinet is still good (i.g., blue color).
  3. Weighing is done only when the laboratory relative humidity is less than 50%. First, the balance is set to 0.0000 when there is no load. A one-point check, nominally at 5 g., is then carried out to ascertain that the balance is still good.
  4. Proceed to weigh all the blank filters conditioned. Each weighed blank filter is then installed unfolded in an envelope with a label recording the blank filter weight. Install the envelope containing a blank filter in the drying cabinet to be ready for use.
  5. Exposed filters should be folded into one-half (exposed surface inward) and conditioned as indicated in step 2. Proceed the weighing of the exposed filters by following step 3 first.
  6. Exposed filter weight is recorded on the same label as the blank filter weight so that the net weight can be derived by subtraction.
  7. 10% re-weighing of the blank and exposed filters is required for internal quality assurance purposes.



4. DISTRIBUTION LIST

C-b Shale Oil Venture

Mr. Robert Thomason  
Dr. George Fosdick  
Mr. Bill Johnson  
Mr. G. D. (Art) Arthur  
Mr. Spencer Bullard  
Mr. Charles Bray

Area Oil Shale Supervisor's Office

2 copies - Attn: Mr. Miles LaHue

EPA Region VIII

2 copies - Attn: Mr. Terry Thoem

Colorado Department of Health, APCD

2 copies - Attn: Mr. Scott Miller

AeroVironment Inc.

Mr. Michael Chan  
Dr. Andrew Huang  
Mr. Bruce Wright  
Mr. John Blair  
Mr. Kurt Bumiller  
Mr. Floyd Mesler

## APPENDIX A

### Equipment Specifications

<u>Equipment</u>	<u>Page</u>
Meloy SA 185-2A SO <sub>2</sub> Analyzer	1
Meloy SO <sub>x</sub> -2 Scrubber to Modify SA 185-2A for use as an H <sub>2</sub> S Analyzer	4
Bendix 8200 Environmental Chromatograph (HC, CO)	5
Meloy OA 350-2 Ozone Analyzer	6
Monitor Labs 8440E NO/NO <sub>x</sub> Analyzer	8
General Metal Works GMWL-2000H High Volume Air Sampler	9
WeatherMeasure W1034 Low Threshold Recording Wind System	10
Meteorology Research 1074-2 Wind Sensor	12
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SPECIFICATIONS  
MELOY SA 185-2A SULFUR DIOXIDE ANALYZER

Note: Use of this analyzer under EPA designation as a an Equivalent Method requires operation on the 0.5 ppm full scale range within a temperature range of 20-30°C and line voltage range of 105 to 125VAC.

Analyzer Performance Specifications\*

Range:	0-0.5 ppm
Noise (RMS) 0% URL:	.002 ppm
80% URL:	.003 ppm
Minimum Detectable Limit:	0.004 ppm
Interference Equivalent:	$\pm$ 0.02 ppm each interferent Max. 0.06 ppm Total interferent Max.
Zero Drift: (12 and 24 hrs):	$\pm$ 0.005 ppm
Span Drift: 20% of URL: (24 hr.) 80% of URL:	$\pm$ 10% Max. $\pm$ 5% Max.
Lag Time:	10 seconds max.
Rise Time (95%)	3 minutes max.
Fall Time (95%)	3 minutes max.
Precision: 20% of URL: 80% of URL:	.005 ppm .005 ppm
Linearity: a) With Linearizer Output (Option S-1)	$\pm$ 1% Full Scale
b) Without Linearizer Output (Log-Linear Output)	$\pm$ 1% Full Scale

\*The definition and the method of determination of these specifications are given in 40 CFR 53 and the Federal Register, Volume 40, Number 33, Part II, "Ambient Air Monitoring Reference and Equivalent Methods", (40 FR, p. 7044, February 18, 1975).

## Analyzer Operational Specifications

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Unattended Operation: (No adjustment of flow or electrical systems)	7 days
Sample Flow Rate:	Approx. 200 ml/min
Hydrogen Flow Rate:	Approx. 125 ml/min
Outputs: (Linear with Option S-1; Log-linear without option)	a) Meter: 0-0.5 ppm b) Recorder: 0-100 mv 0-1 V
Relative Humidity Range:	0-95%
Ambient Temperature Range:	20 to 30°C (EPA approved), 10-40°C*
Voltage Range:	115 $\pm$ 10 VAC, 60 Hz
Power Requirements:	250 Watts

## Analyzer Configuration Specifications

Weight:	40 to 50 lbs (18 to 22 Kg) depending on options included
Case Dimensions:	17" (43.2 cm)W x 20" (50.8 cm)L x 12 1/4" (31.1 cm)H
Mountings Available:	a) Bench b) Rack (optional), 19" (48 cm) wide
Sample Pump:	Internal

\*\*Use of this analyzer under EPA designation as a reference method requires operation within a temperature range of 20 to 30°C and 105 to 125 VAC. However, the analyzer will operate over 10 to 40°C with only a small increase in the noise, precision, and drift specifications stated.



H<sub>2</sub>S SCRUBBER SPECIFICATIONS

Life:

- a. In excess of 9000 hours  
at typical ambient H<sub>2</sub>S  
level of 5 ppb.
- b. In excess of 450 hours  
for H<sub>2</sub>S concentration  
levels not exceeding  
0.1 ppm.

Scrubbing Efficiency:

98% H<sub>2</sub>S while passing 98%  
or greater SO<sub>2</sub>.

Sample Lines

1/8" (3.175 mm) OD  
Teflon Tubing

Size:

4" (10 cm) long x .625"  
(1.6 cm) diameter

SPECIFICATIONS  
MELOY  $\text{SO}_x$ -2 SCRUBBER TO MODIFY SA 185-2  
FOR USE AS AN  $\text{H}_2\text{S}$  ANALYZER

The  $\text{SO}_x$ -2 Scrubber is an accessory unit designed specifically to be utilized with Meloy Sulfur Analyzers. This scrubber removes Oxides of Sulfur to allow the FPD Analyzer to measure total reduced sulfurs such as  $\text{H}_2\text{S}$ ,  $\text{CS}_2$ , Mercaptans, etc.

SPECIFICATIONS  
BENDIX 8200 ENVIRONMENTAL CHROMATOGRAPH

Ranges:	Stepwise attenuation for each component with 1, 2, 5, 10, 20, 50 and 100 sequence. Basic range selectable from 0-1 ppm to 0-100 ppm.
Precision:	$\pm 1\%$ of full scale.
Noise Level:	0.5% of full scale.
Zero Drift:	Less than $\pm 1\%$ per day and $\pm 2\%$ for three days with automatic zero before each component.
Span Drift:	Less than $\pm 1\%$ per day and $\pm 2\%$ for three days.
Interference Equivalent:	Less than 1 ppm.
Linearity:	Better than 2% of full scale.
Oven Temperature:	Controlled to $\pm 0.5^\circ\text{C}$ .
Cycle Time:	Five minutes.
Operational Period:	More than 3 days unattended.
Output Signal:	Trend outputs of 0-1 volt or 1-5, 4-20, or 10-50 mdc at 12 volts for each component. Other voltages available.
Readout:	Chromatogram and trend.
Power:	115 vac, 60 Hz.

SPECIFICATIONS  
MELOY OA 350-2 OZONE ANALYZER

Performance Specifications

Range: 0 to .01 ppm  
0 to .1 ppm  
0 to .5 ppm  
0 to 1.0 ppm  
0 to 5.0 ppm  
0 to 10.0 ppm

Minimum Detectable  
Sensitivity: 0.0005 ppm

Noise:  $\pm 0.3\%$  on 0.5 ppm scale

Lag Time: less than 10 sec.

Rise Time (95%) less than 15 sec.

Fall Time (95%) less than 15 sec.

Precision:  $\pm 2\%$  F.S.

Zero Drift:  $\pm 1\%$  F.S. per day on 0.5 ppm scale  
 $\pm 2\%$  F.S. per day on 0.01 ppm scale  
 $\pm 2\%$  F.S. per 3 days on 0.5 ppm scale

Span Drift: less than  $\pm 1\%$  per day on 0.5 ppm scale  
less than  $\pm 2\%$  per 3 days on 0.5 ppm scale

Linearity:  $\pm 1\%$  F.S.

Operational Specifications

Unattended Operation: 7 days  
(No adjustment of  
flow or electrical  
systems)

Sample Flow Rate: Approximately 500 ml/min



Ethylene Flow Rate: Approximately 30 ml/min  
Power Requirement: 115 VAC, 50-60 Hz, 250 Watts  
Outputs: (a) Meter: 0-10 ppm  
(b) Recorder: 0-100 mv and 0-1 volt

Relative Humidity Range 10 to 95%

Ambient Temperature Range: 10-40°C for specified specifications

Configuration Specifications

Weight: Approximately 40 lbs  
Case Dimension: 19" W x 20" L x 12 1/4" H  
Mounting Available: (a) Bench (Standard)  
(b) Rack (Optional)  
Sample Pump: Internal

## 1.2 SPECIFICATIONS

Zero Instability:

Less than 0.1% full scale/mo.,  $\pm 30^{\circ}\text{C}$   
from set temperature  $0.025\%/^{\circ}\text{C}$  over the  
range  $25^{\circ}\text{C} \pm 20^{\circ}\text{C}$

Span Stability:

Less than  $\pm 1\%$ /day span drift from all  
sources  $\pm 50^{\circ}\text{C}$  from cal. temp.

Less than  $\pm 2\%$  span drift/14 days  $\pm 50^{\circ}\text{C}$   
from cal. temp.

Maximum temperature coefficient of span  
 $0.2\%/^{\circ}\text{C}$  over the range  $25^{\circ}\text{C} \pm 20^{\circ}\text{C}$

Lag Time:

Less than 3 sec. from step change at input

Repeatability:

$\pm 1\%$  NO and NO<sub>x</sub> output

$\pm 1.4\%$  NO<sub>2</sub> output

Operating Temperature:

$0^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$

Detection Limit:

2ppb for NO, NO<sub>2</sub>, NO<sub>x</sub>

Measuring Ranges:

0.2, 0.5, 1.0, 2.0 and 5.0 ppm full scale  
(ranges to 5000 ppm available)

Response Time:

1.0 sec., 5 sec., 20 sec., 1 min, nominal,  
switch selectable

Settling Times % of final answer

Range	63.5%	90%	99%
1	1 sec.	2.3 sec.	4.6 sec.
2	5 sec.	11.5 sec.	23 sec.
3	20 sec.	46 sec.	92 sec.
4	1 min.	2.3 min	4.6 min.

SIGNAL  
OUTPUTS

Recorder:

0-100mv-zero adjustable  $\pm 5\text{mv}$ , up scale  
adjustable  $\pm 20\%$

DVM:

0-1v, 0-2v, 0-5v, 0-10v optional

0-2v, 0-1v, 0-.1v, 0-5v, 0-10v optional

Meter Jack:

Output impedance less than 2.5K ohms

Front Panel 0-1v, adjustable, 10-turn  
calibrated pot

Connector:

Terminal Strip

STATUS OUT  
(OPTIONAL)

Range:

One of 5 transistor buffered (open collector

Time Constant:

One of 4 transistor buffered outputs

Function:

Transistor-buffered, closure

Warning:

Transistor-buffered, closure

Power Failure:

No Closure on range or status

Connector:

ML 005C0001 supplied

FLOW RATES

Sample:

500 cc/min. each channel nominal

Ozone:

80 cc/min. each channel nominal

Support Gas Required:

Ambient Air

Sample Line Material:

Stainless Steel and Teflon

Power:

115VAC 50/60 HZ

Weight:

32 kg (70 lbs)

Dimensions:

2 modules each 22.2 cm (8 3/4") high,  
48.3 cm (17") wide, 44.1 cm (17") deep  
May be stacked, set side by side or  
rack mounted.



# MODEL GMWL-2000 H

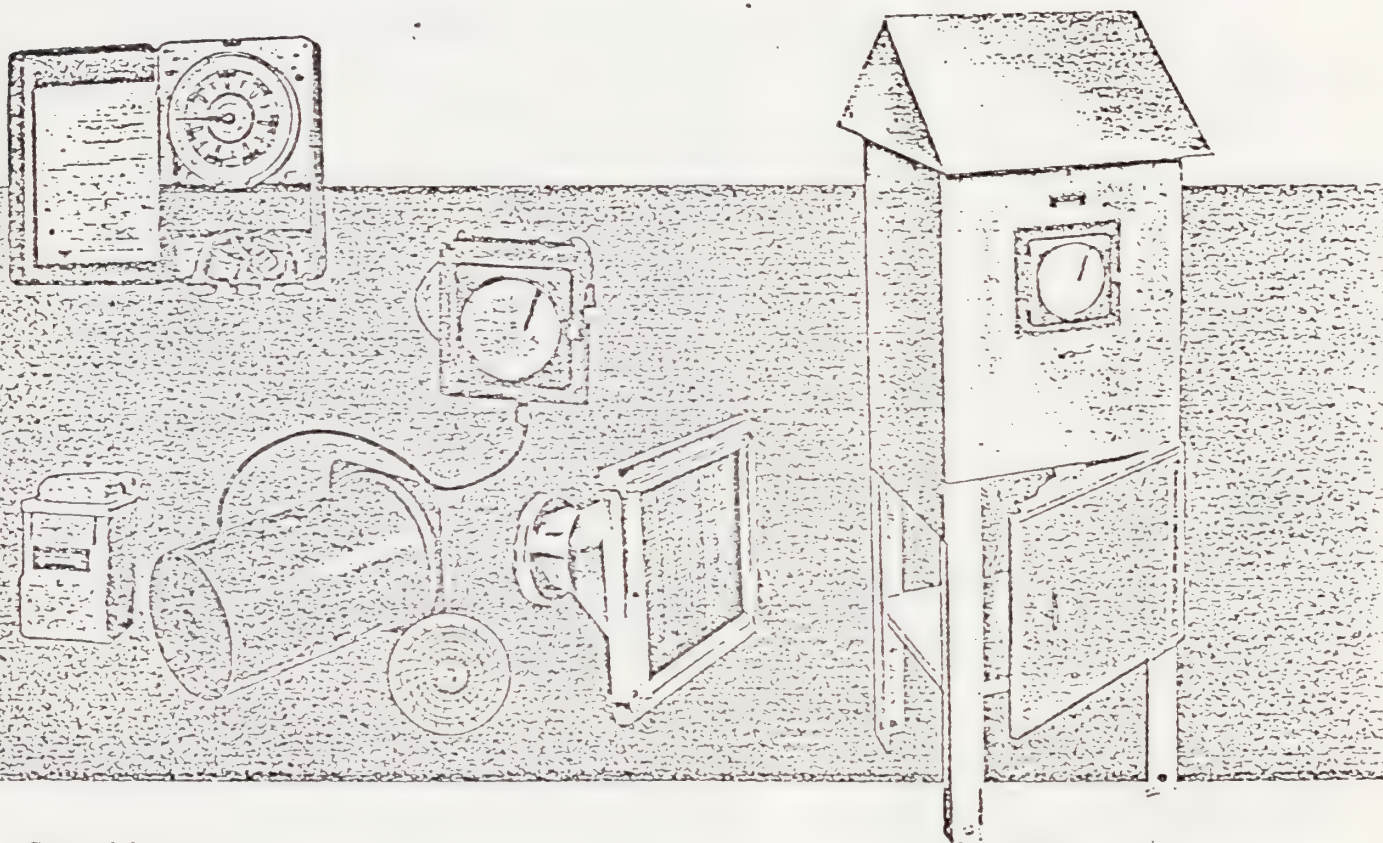
## High Volume Air Sampler

Designed for continuous operation in an all weather environment, the Model GMWL-2000 H is a complete monitoring station for the collection of suspended particulate matter with precise measurement capability. All instruments and components are mounted within the aluminum shelter for complete protection. The hinged roof facilitates filter media exchange.

The Model GMWL-2000 H is complete with high volume sampler, seamless stainless steel filter holder, pressure transducer recorder, 50 charts, ink and 90-volt protective transformer all housed in the aluminum shelter ready to operate. A seven day regular timer Model GMW-70 is included as standard equipment. The timer/programmer Model GMW-80 is optional.

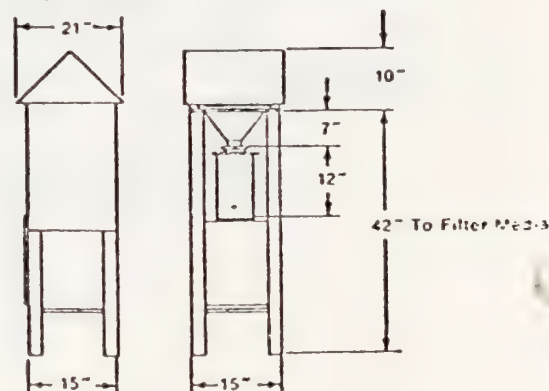
The sampler is a heavy duty turbine type blower with high speed motor arranged with a fixed orifice on the discharge end. Although factory calibrated against a water manometer, recalibration is suggested to suit barometric conditions at the site. Air flow is accurately measured by the pressure transducer which provides a permanent record of every sample.

Four bolts, easily accessible, permit motor removal for periodic brush replacement. Special U-clip connectors facilitate brush changing and prevent damage to the internal leads. The 90-volt transformer reduces the operating voltage to approximately triple normal brush and motor life.



### Specifications:

Motor HP — 0.6  
Speed — 13,500 R.P.M.  
Amperage — 4.9  
Wattage — 440  
Max. Flow Rate — 52 C.F.M.  
Min. Flow Rate — 20 C.F.M.  
Power Source — 115 V, 1 phase, 60 Hertz (other electrical characteristics available on request)  
Net Weight — 63 lbs.  
Shipping Weight — 70 lbs.  
Meets all Federal performance and dimensional specifications including Federal Register Vol. 36, No. 84 dated April 30, 1971





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are made of 0.025" thick stainless steel. Turning radius of the assembly is 2 3/4". Weight of the assembly, including central hub, is 63 grams.

- b. Cup Assemblies — 6 Cup Type (U.S. Pat. No. 3,541,800). Eliminate pulsing and reduce errors due to non-horizontal wind flow.

1) "6L" Cup Assembly — Staggered 6-cup assembly constructed of same material as "3L" cups. Weight of assembly is 37 grams.

2) "6SS" Cup Assembly — Staggered 6-cup assembly constructed of stainless steel and similar to "3SS" assemblies. Weight of "6SS" cups is 128 grams.

- c. Speed Transducers

1) High Frequency Tachometer — For low threshold applications, a unique frictionless tachometer employing a high frequency oscillator and receiver is used to precisely measure wind speed. The oscillator, transmitter and receiver are encapsulated in a small cube of epoxy for total protection against the environment. The transmitter and receiver are separated by a 1/8 inch space in which a thin notched disc of aluminum, attached to the sensor shaft, is free to rotate. As each notch in the disc passes between the transmitter and receiver, a ~12 volt square wave pulse is produced. Discs are notched to provide fourteen output pulses per revolution. An input of 12 volts DC, 10 mA is required to power the tachometer circuitry. The output pulse train is fed into a frequency to analog converter in the wind system translator to permit data recording or telemetry. The operating temperature range of the high frequency tachometer is -30° to +140° F.

The high frequency tachometer embodies several distinct advantages over the commonly used light chopper system. There are no light bulbs or photocells to burn out; power consumption is low; and the system is insensitive to moisture condensation or dust deposition. The solid state tachometer is essentially free from maintenance with a life of well over five years when operated continuously.

2) DC Generator — Long life DC generators can be supplied where starting torque is not critical. Generators have a life of three to four years and have an approximate output of 500 mV at 50 MPH.

## SPECIFICATIONS

### W103 Cup Anemometer

- Size ..... 16 1/2" h x 7" d overall
- Cup Assemblies

Type	Cup Diameter	Turning Radius	Weight (grams)
"3L" Lightweight	2"	3 1/4"	18
"3S" Standard Weight	3"	4"	42
"3SS" Stainless Steel	2"	3 1/2"	63
"6L" Lightweight, 6-cup	2"	3 3/4"	37
"6SS" Stainless, 6-cup	2"	3 3/4"	128

- Transducers

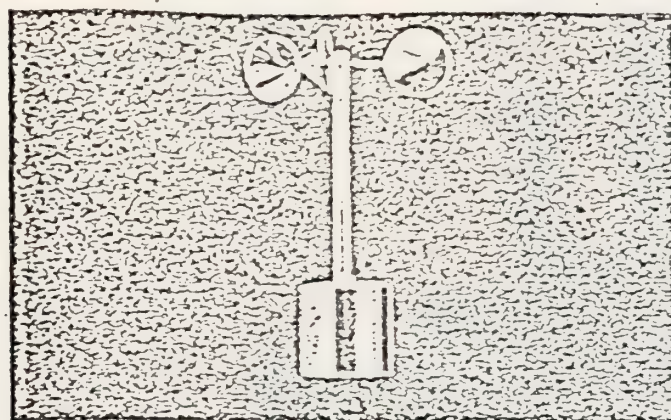
Frictionless High Frequency Tachometer — 12 VDC, 10 mA input, ~12 VDC square wave output; 14 pulses/RPM standard

DC Generator — Approx. 500 mVDC at 50 MPH

- Accuracy ..... ±1% or 0.15 MPH, whichever is greater
- Construction ..... Anodized aluminum and stainless steel
- Bearings ..... Sealed and shielded precision stainless steel
- Response Characteristics

High Frequency Tachometer Transducer	Threshold (MPH)		Distance Const. (FL)	
	3-Cup	6-Cup	3-Cup	6-Cup
Model "L" Cups	0.6	0.6	5	7.3
Model "S" Cups	0.8	N/A	7.4	N/A
Model "SS" Cups	0.9	0.9	14.3	21.1

DC Generator Transducer	3-Cup	6-Cup	3-Cup	6-Cup
Model "L" Cups	1.0	1.0	5	8
Model "S" Cups	1.1	N/A	8	N/A



Model W103 Cup Anemometer

## DESCRIPTION

A high response, low threshold wind system which offers the optimum in versatility and economy. Design features of the cup anemometer and single fin aerodynamic vane permit a choice of sensor options to meet program needs and budgetary requirements. Electronic signal conditioning packages are available for any combination of sensor options. Anemometer and vane housings are cast from a special aluminum alloy and are aged before machining. Surfaces are anodized after machining. Sealed and shielded stainless steel permanently lubricated bearings and stainless steel precision ground shafts are used exclusively. Cannon connectors, mounted on the base of the housing, support the sensors as well as providing for electrical connection. Thus, after initial installation, sensors can be removed for routine maintenance by simply uncoupling the Cannon connector. Brass housings are available as an option for use in extremely corrosive marine environments.

Basic components of the W1034 Low Threshold Wind System are:

- Model W103 Lightweight Cup Anemometer, with high frequency frictionless tachometer or DC generator.
- Model W104 Lightweight Vane, with single or dual wipers.
- Model WT1034/360-(x) or WT1034/540-(x) Translators.
- Model W101-DGO, Two Pen, Dual Channel Galvanometric Strip Chart Recorder (DC only) or Model REW 2P-12V/12V, two pen, potentiometric strip chart recorder for AC operation.

Descriptions and specifications for the various options of each of the basic components of the system are given below.

### Model W103 Cup Anemometer

Options available with the Model W103 Cup Anemometer include 5 different cup assemblies and 2 types of speed transducers. Cup assemblies can be 3 cup or staggered 6 cup. Three-cup assemblies are supplied as standard and are best suited for most applications. Six-cup assemblies eliminate pulsing at low wind velocities. Material used in the construction of the cups includes lightweight metallized butyrate, standard weight polycarbonate, plastic or stainless steel. Transducers available are a frictionless high frequency tachometer providing a pulsed square wave output signal or, where maximum sensitivity is not required, a low torque DC generator.

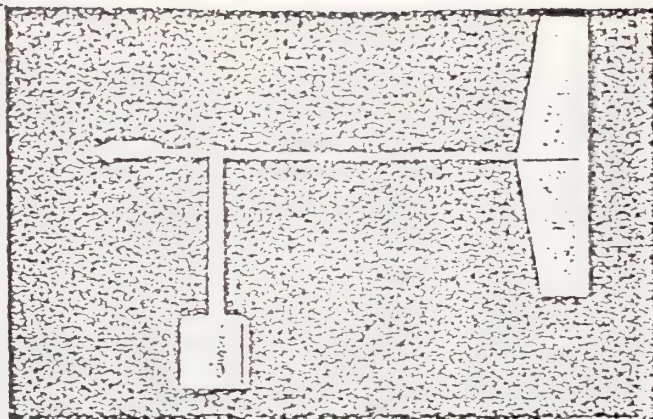
- Cup Assemblies — 3 Cup Type

1) "3L" Cup Assembly, Lightweight — For low threshold applications. Cups are formed from 0.010" thick metallized butyrate suspended on a tubular stainless steel frame. The cups are conical shaped with a 2" diameter. Turning radius of the assembly is 2 3/4". Weight of an individual cup, including supporting frame, is 5 grams. Weight of the complete assembly, including the central hub, is 18 grams.

2) "3S" Cup Assembly, Standard Weight — For general purpose application. Molded of durable lexan plastic, 0.030" thick. Cup diameters are 3" and assembly turning radius is 3 1/2". Complete cup assembly weight, including central hub, is 42 grams.

3) "3SS" Cup Assembly, Stainless Steel — Cups and supporting frame made of stainless steel. Cup diameters are





### Model W104 Light Weight Vane

The Model W104 Lightweight Vane features a special low density, high structural strength foam plastic tail coated with a high density epoxy and bonded to a stainless steel rod. Weight of the entire tail assembly, including rod, is 35 grams. A stainless steel counterbalance, located close to the center of rotation, permits maximum response to wind fluctuations with minimum overshoot. The tail has an airfoil shape. Tail dimensions are approximately 4" wide x 12" high x 1/4" thick at the center and 1/8" thick at the tip. The center of the tail is normally located 12 inches from the axis of rotation.

The vane rotates on a stainless steel shaft mounted in miniature stainless steel precision bearings.

1000 ohm low torque potentiometers, supplied with one wiper for 0 to 360° applications and with two wipers for 0 to 540° systems, are standard. Other resistances are available on special order.

### W104 Light Weight Vane

#### • Response Characteristics:

Wire Wound Pot	Dead Band (Degrees)	Damping Ratio	Distance Constant (ft)
1 wiper	3	0.4	~3.5
2 wipers	0	0.4	~3.5

- Threshold ..... 0.75 mph
- Potentiometer Linearity ..... 0.5% std., 0.25% special
- Resolution ..... 0.72 degree
- Material ..... Tail—plastic; housing—aluminum; shaft, bearings & counter balance—stainless steel
- Size ..... Overall—21½" h x 21" l Tail—4"W x 12"H x ¼" Thick at center & 1/8" at tip; airfoil
- Weight ..... Tail and supporting arm, 35 gms. Complete assembly, 1.6 lbs.

### Translators

Stabilized power to operate the wind sensors; signal conditioning and ranging of the sensor outputs; and impedance matching to recording systems are provided by the Model W1034 Translator. Translators are available with either 0 to 360° or 0 to 540° output range for wind direction. Ranges to 0 to 50 mph and 0 to 100 mph are normally provided for wind speed. Other ranges can be obtained on special order. Automatic range switching, with an event pen to indicate the range, is also available as an option.

All circuitry is solid state, employing the latest in integrated circuitry design. Linearity is ±0.1%. The units may be operated from either 12 VDC or 115 VAC, 50/60 Hz.

When purchased as a complete wind system, translators are built into the recorders. If sensors are to be used separately or with data logging or telemetry systems, separate enclosures for the translators are provided.

SPECIFICATIONS  
METEOROLOGY RESEARCH 1074-2  
WIND SENSOR

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## Specifications

The accuracies stated are "worst case" and represent the conditions where all components of the system are subjected to the full temperature range of  $-40^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$ . Where the electronics portion of the system is in a less adverse temperature environment, improvements in accuracy up to 50% can be realized.

### Wind Sensor 1074

#### Wind Speed

Starting Threshold	
Light Chopper and Switch Closure	0.75 mph
Generator	1.5 mph
Response Distance	18 ft. (63% Recovery)
Flow Coefficient	7.9 ft./Rev.
Accuracy	
Light Chopper and Switch Closure	$\pm 0.4$ mph or 1% (whichever is greater)
Generator	$\pm 0.5$ mph or 1% (whichever is greater)
Range	
Light Chopper	0-20, 0-60 or 0-100 mph
Generator	0-100 mph
Switch Closure	for each 1/10 Mile
Output	
Light Chopper and Generator	Voltage 0 to $+5$ VDC
	Impedance $< 100$ ohms
Operating Temperature	$-40^{\circ}\text{C}$ to $+50^{\circ}\text{C}$

#### Wind Direction

Starting Threshold	0.75 mph
Delay Distance	4 ft. (50% Recovery)
Damping Ratio	0.5 to 0.6
Accuracy	
360°	$\pm 1\%$
540°	$\pm 1\%$
Range	0° to 360° or 0° to 540°
Output	
Voltage	0 to $+5$ VDC
Impedance	$< 100$ ohms

#### Instrument Dimensions

Weight	4.3 kg & 4.8 kg (9½) & (10½ lb.)
Height	53.3 cm (21 in.)
Diameter	17.8 cm (7 in.)
Length	85 cm (33.5 in.)
Mounting	2.5 cm (1") Standard Pipe

SPECIFICATIONS

METEOROLOGY RESEARCH 1071 MECHANICAL WEATHER STATION

Wind Direction — Damped aluminum vane	
Delay Distance	1.2 m (4 ft.) 50% Recovery
Damping Ratio	0.5 to 0.6
Starting Threshold	Less than 0.33 mps (0.75 mph)
Overall Accuracy	±1% full scale
Wind Run (Speed) — Fast response aluminum cups	
Flow Coefficient	2.41 m (7.90 ft)/revolution
Flow per recording traverse	16 km (10 miles)
Response Distance	5.49 m (18 ft.) with 63% Recovery
Starting Threshold	Less than 0.33 mps (0.75 mph)
Overall Accuracy	±2%
Temperature — Shielded bimetal coil sensor	
Low Range (Field Selectable)	-68°C to +15.5°C (-90°F to +60°F)
High Range (Field Selectable)	-35°C to +49°C (-30°F to +120°F)
Absolute Accuracy	±1.67°C° (±3F°)
Resolution	0.55C° (1F°)
Humidity	
Accuracy	±3%
Range	0 to 100%
Ambient Temperature	-40°C to +49°C (-40°F to +120°F)
Response	3 min., 63% of step change
Finish	
White Polyurethane	A modern plastic coating that withstands extreme temperatures with superior protection and color retention.

Rainfall — Low inertia tipping bucket	
Accuracy	at 5.08 cm (2") per hr within ±1%
Resolution	0.25 cm (0.01") per recording step
One Tip	7.95 cc of water
Cabling	6.1 m (20 ft) connecting cable included
Recorder — Incremental Drive	
Battery-Operated	Four (4) EVEREADY Alkaline Energizer No. E95, D, 1.5 Volt batteries.
Chart Roll Speeds	Selectable 10 mm per hr runs for 65 days; or 20 mm per hr runs for 32 days
Chart Paper	Plastic coated, pressure sensitive with black trace, in 15.8 m (52') rolls. Useful chart width is 10.2 cm (4").
Weights	
Model 1071, 1076	9.53 kg (21 lbs)
Shipping weight ls	13.6 kg (30 lbs)
Model 1072, 1077	10.4 kg (23 lbs)
Shipping weight ls	20.4 kg (45 lbs) in two containers
Field Case	add 5.89 kg (13 lbs)
Instrument Dimensions	
Weather Station	64 cm (25") height overall, body 20 cm (8") diameter, vane length 85 cm (33.5")
Rainfall Collector	61 cm (24") height and 20 cm (8") diameter
Tripods	
Hot-dipped, galvanized-coated steel construction. In open position the feet form an equilateral triangle, 78.7 cm (31") on a side. The height of the instrument depends upon the length of the nominal 2.54 cm (1") dia. center pole held in place with hex set bolts at the center of the horizontal bracing.	
Model 1410-8 is adjustable from 1.52 m (5') to 2.44 m (8')	
Model 1412-18 is adjustable from 3.04 m (10') to 5.49 m (18')	



# WEATHERMEASURE T621-TP18X REMOTE TEMPERATURE INDICATOR

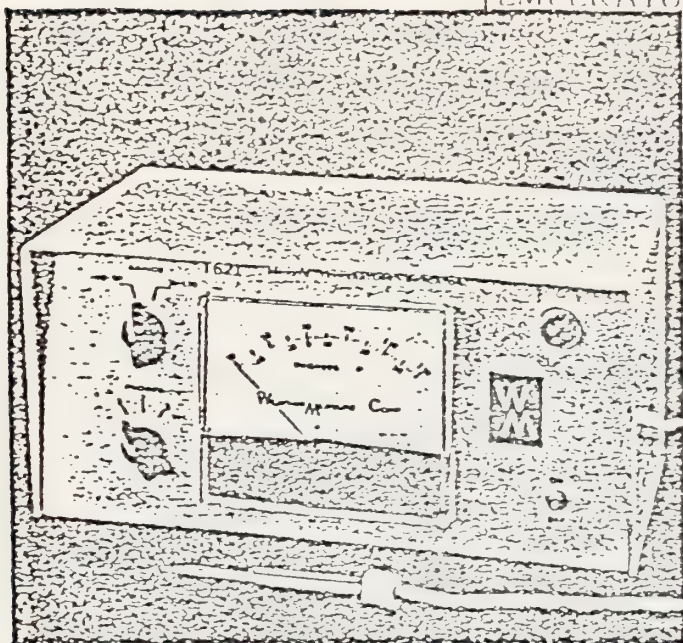
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- Temperature Ranges (Std.) . . . . . -40°F to +60°F or  
+30°F to 130°F; or -30°C to +20°C and  
(Custom boards; any 100°F range between -20°F  
and 212°F.)
- Accuracy  
Panel Meter . . . . .  $\pm 1^\circ\text{F}$   
Recorder Signal Output . . . . .  $\pm 0.3^\circ\text{F}$
- Temperature Sensor . . . . . Linear thermistor,  $\pm 0.15^\circ\text{C}$   
linearity, std;  $\pm 0.055^\circ\text{C}$   
optional.
- Sensor Housing . . . . . Stainless steel sheath or  
exposed bead
- Power . . . . . 115 V AC, 50/60 Hz or +12 DC; 10 ma
- Size . . . . . 12" W x 6 1/2" H x 6 1/2" D
- Output to Recorder . . . . . 0-1V DC or 0-10 mA standard  
others on request
- Weight/Shipping (less cable) . . . . . 4 lbs/10 lbs



**T621 REMOTE TEMPERATURE INDICATOR**  
(With Recorder Output)

## DESCRIPTION

The T621 Remote Temperature Indicator provides a visual indication of temperature as well as an output signal for recording of temperature on a data logger or strip chart recorder. A precision linear thermistor is used as the temperature sensor. Temperature is displayed on a 4 1/2" panel meter with an accuracy of  $\pm 1^\circ\text{F}$ . The recording output signal is within  $\pm 0.3^\circ\text{F}$ . The T621 has two ranges, -40°F to +60°F and 30°F to 130°F. Operation is from 115 V AC or battery power. Up to three temperature probes can be connected to the T621.

Thermistor accuracy, linearity, and interchangeability is  $\pm 0.27^\circ\text{F}$  over the temperature range from -22°F to 212°F. For special applications linearities as low as  $\pm 0.055^\circ\text{C}$  can be provided. The thermistor is sealed with epoxy cement in a stainless steel tube or can be allowed to remain exposed to air if rapid response time is required.

The solid state electronics make use of operational amplifiers to sense changes in thermistor resistance with temperature. The resulting signal is amplified and ranged to operate the panel meter and to provide an output signal suitable for recording on either a galvanometric or potentiometric recorder or a data logger. The output signal can be adjusted to any full scale span in the range from 0 to 1 V DC or 0 to 10 ma.

Temperature sensor and temperature range selection is by means of front panel mounted switches.

For operation on battery power, a 12V DC battery is required.

For maximum reliability the probe and cable should be factory connected and sealed.

## APPLICATION

Remote sensing and/or recording of soil, air, and water temperature for meteorological, hydrological, or industrial operations.

## ORDERING SPECIFICATIONS

- T621 Remote Temperature Indicator, complete with one standard temperature probe in stainless steel tube (specify sealed or exposed bead.) With recorder output signal, 115 VAC, 50/60 Hz. Specify °F or °C.
- T621-DC Remote Temperature Indicator, same as above except operates on 12V DC or 115 VAC, 50/60 Hz.
- T621-BD105-1 Ambient Temperature Circuit Board for custom systems, including calibration resistors for 0 and full scale calibration points, mating 22 pin connector, premium range resistors.
- T621-T18 Air Temperature Standard Thermistor Probe, 1/4" o.d. x 3" L stainless steel jacket, interchangeability  $\pm 0.15^\circ\text{C}$ , less cable.
- T621-T018 Same as above except with perforated stainless steel jacket.
- T621-TP18X Air Temperature Premium Thermistor Probe, 1/4" o.d. x 3" L, stainless steel jacket, interchangeability  $\pm 0.055^\circ\text{C}$ .
- T621-TP018X Same as above except with perforated stainless steel jacket.
- T621-TW18 Water Temperature, standard thermistor probe, 1/4" o.d. x 3" L, stainless steel jacket, interchangeability  $\pm 0.15^\circ\text{C}$ .
- T621-TWP18X Water Temperature, premium thermistor probe, 1/4" o.d. x 3" L, stainless steel jacket, interchangeability  $\pm 0.055^\circ\text{C}$ .
- T621-C 3 conductor cable to connect air temperature probe to indicating console
- T621-CW 3 conductor neoprene jacketed cable to connect water temperature probe to indicating console.



## SPECIFICATIONS

### METEOROLOGY RESEARCH 840 TEMPERATURE SENSORS

#### Temperature & Relative Humidity Sensor/840-1, 2, 3, 7, & 842-1, 2, 3

##### Sensor Housing: (Model 840, 842 Aspirator)

Effect of Radiation	<0.05°C under maximum solar radiation conditions
Air Flow	5 ft/sec for RH — 15 ft/sec for Temp
Blower	Continuous duty
Air Flow Indicator	Micro switch (optional)

##### Sensing Element:

Temperature Sensing Elements:	P/N ES 15966 Probe	P/N ES 16196 Probe
Accuracy	± 0.15° C	± 0.10° C
Output	15968 Ω to 5835.5 Ω	20158 Ω to 7242 Ω
Range	-30° C to -150° C	-50° C to -150° C

##### Humidity Sensing Element:

	P/N ES 17350 Transducer
Accuracy	±3.0% R.H.
Range	0% to 100% Relative Humidity

##### Physical Characteristics

Overall Length	Model 840	Model 842
	106.4 cm (41.9 in)	119.4 cm (47 in)
Glass Shields	5.6 cm (2.18 in) OD x 3.2 cm (1.25 in) ID x 19.0 cm (3.5 in) long	
Mounting	Model 544 Mounting Bracket	
Blower Housing	16.5 cm (6.5 in) diameter	
Shipping Weights	Model 840	Model 842
	5.9 kg (13 lb)	6.8 kg (15 lb)

##### Power Requirements

Blower	115 V/50-60 Hz 7 watts nominal
--------	--------------------------------

##### Environmental Capabilities, Operational

Temperature	-50° C to -150° C
Humidity	0% to 100% RH including precipitation
Wind Speeds	To 100 mph
Altitude	To 20,000 feet
Sand and Dust	As normally encountered in desert areas
Salt Atmosphere	As normally encountered in coastal areas

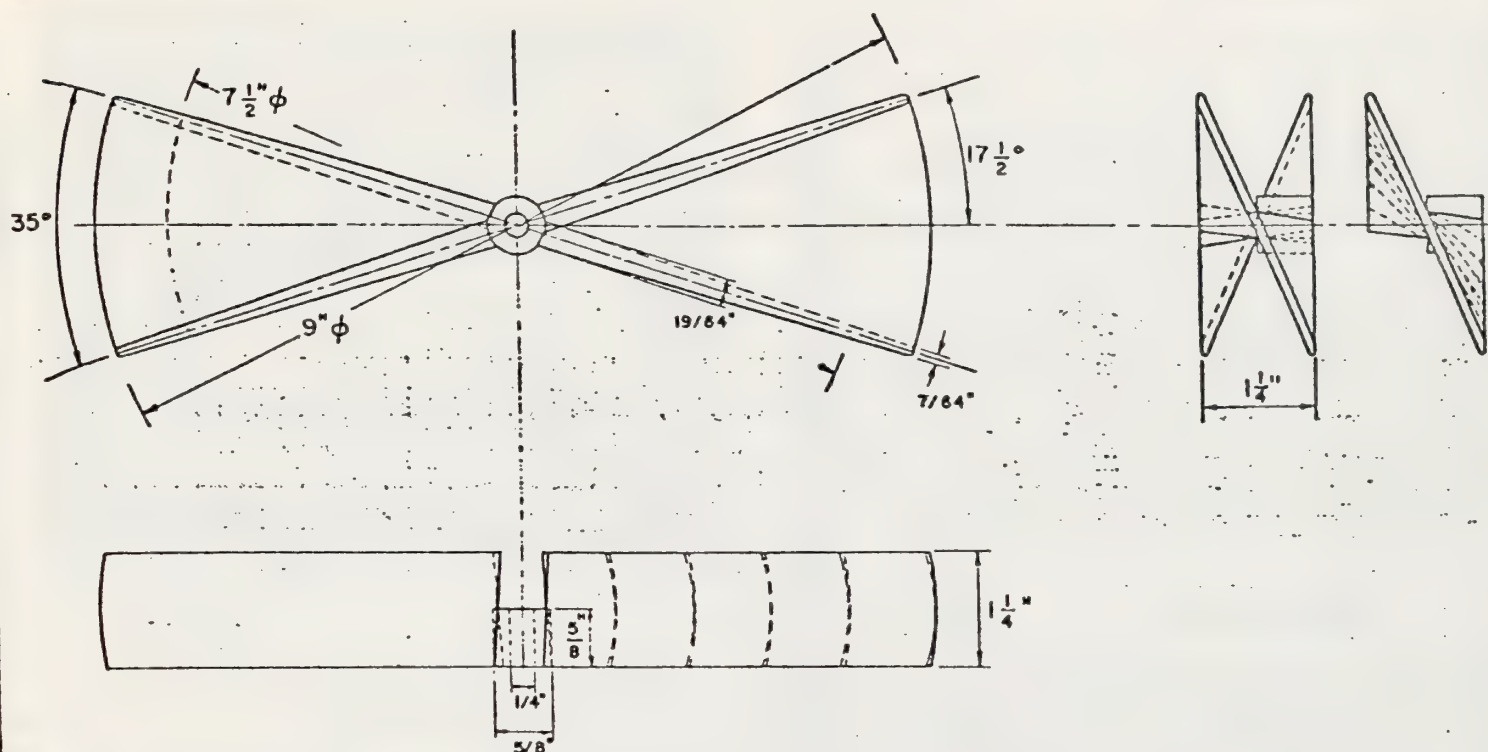
# PROPELLER SPECIFICATIONS

## MAXIMUM RESPONSE POLYSTYRENE PROPELLERS



Section No. A  
Revision No. 2  
Date: 6 June 1973  
Page 16 of 20

R. M. YOUNG  
COMPANY



CATALOG NO:	21180/27105	21182/27106	21183/27107	21184/27108
PRICE:	\$24.00	\$17.00	\$19.00	\$26.00
BLADES:	4	2	2	4
DIAMETER:	9 IN.	9 IN.	7 1/2 IN.	7 1/2 IN.
RANGE (HEAD-ON):	70 MPH	90 MPH	100 MPH	90 MPH
RANGE (ALL ANGLES):	50 MPH	75 MPH	90 MPH	70 MPH
THRESHOLD:	0.2-0.4 MPH	0.3-0.5 MPH	0.4-0.6 MPH	0.3-0.5 MPH
DISTANCE CONSTANT:	3.1 FT.	2.4 FT.	2.8 FT.	2.7 FT.

These propellers are molded of expanded polystyrene beads. The helicoid form has a pitch of  $360^\circ$  in 1.04 ft (or 0.96 rev per ft). Four blade propellers are made from two blade moldings dovetailed together at the hub. Epoxy fillets are added to the hub area for increased strength and propellers are then sprayed and balanced with special formulation acrylic paint. Propellers 7 1/2" in dia. are fabricated from 9" dia. moldings with slightly larger epoxy fillets added in the hub area.

Four blade propellers provide slightly better symmetry of response to various wind angles especially near the stall region ( $90^\circ$  wind angle).

Threshold is measured with propeller mounted on 3/16" dia. shaft supported on precision instrument grade ball bearings with light chopper type transducer. Miniature tachometer generator increases threshold 0.1-0.2 MPH for 9" dia. and 0.2-0.3 MPH for 7 1/2" dia. propellers.

II B-361

10/1/72

Model 300A Specifications

---

Transmitter:

Frequency - 1600 Hz  
Pulse Width - 50, 100, 200 ms  
Output Power - 25 Watts standard  
                  100 Watts optional  
Output Impedance - 8 Ohms  
Pulse Repetition Rate - 1 per 9 sec. (500 m scale)  
                              - 1 per 18 sec. (1000 m scale)

---

Receiver:

Gain -  $10^8$   
Gain Compensation - proportional to time of  
                          echo return.  
Bandwidth - 20, 40, 80 Hz  
Range - 500 m, 1000 m full scale  
          - 20 m minimum  
Resolution - 20 m

---

THI Display:

Writing Technique - electrical engraving of  
                          conductive paper.  
Chart Size - 6" (15.2 cm) wide by 72" (22 m) long  
Chart Speed - 1.2" (3.05 cm) per hour  
Chart Duration - 28 days

---

Size and Weight:

17" W x 17" H x 6" D, 45 lbs.

---

Power Input:

115V, 60 Hz, 50W average, 250W peak

---

Model 300A Options

Option 001 - 100W Transmit Power - improves signal-  
                  to-noise by 6 db.  
Option 002 - Allows use of 220-240V power  
Option 003 - Allows use of 50 Hz power  
Option 004 - Full-scale range of 250 m or 500 m  
Option 005 - Full-scale range of 750 m or 1500 m

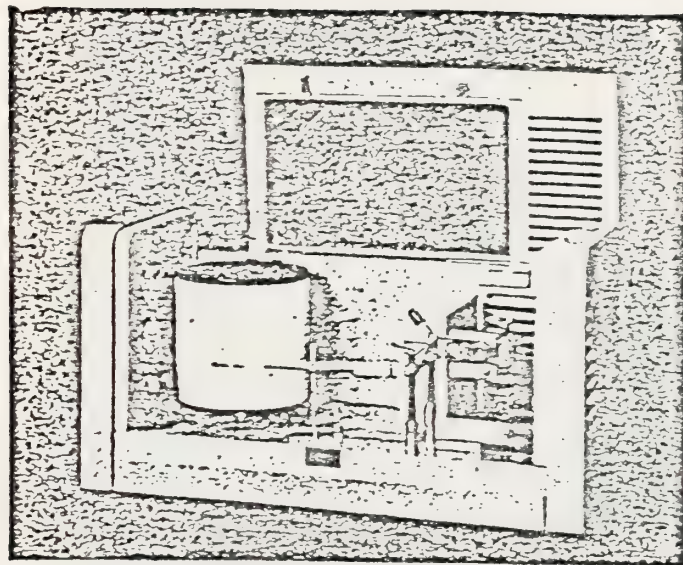
 AEROVIRONMENT INC.

ATMOSPHERIC AND AIR QUALITY RESEARCH, SERVICES AND PRODUCTS

145 VISTA AVENUE PASADENA, CALIFORNIA 91107 213 449-4392

II B-362





H324 SKYLINE HYGROGRAPH

## DESCRIPTION

Features the new WeatherMeasure *Skyline* series instrument case design. Advantages include wrap-around front window for easy record observation, modern styling, ready access to all moving parts through the hinged door which lifts up and back, and the use of corrosion resistant materials such as corrosion resistant duraluminum alloy, brass and stainless steel for all parts.

Humidity is measured over the range of 0- 100% using time-tested human hair as the sensing element. Expansion and contraction of the dual hair bundles are magnified by a unique lever system. One hair bundle moves a lever fulcrumed at the center and connected to a second hair bundle. The second bundle of hair is looped through a lever which moves the pen arm. Non-linearity in the expansion and contraction of the hair due to changes in humidity are corrected by use of two opposed quadrants in the linkage system.

Calibration adjustments are easily accomplished by rotating the hex nut controlling the tension on the hair bundles. The key used to wind the clock is also used for calibration adjustments. Openings in the sides and base of the instrument permit free movement of ambient air to the hair bundles.

An 8-day spring wound clock is mounted on the sturdy cast aluminum instrument base. Change gears are provided to rotate the clock drum at 1-day or 7-day intervals. The drum revolves in 26 hours when the 1-day gear is used, and in 172 hours when the 7-day gear is used. Thus, the recording chart can be changed each day or each week before the pens have reached the chart clip.

All internal moving parts are chrome-plated brass or stainless steel. Corrosion resistant parts are used throughout. Case sides are indented at the top to serve as hand grips for moving. An ink bottle well is provided on the base of the instrument. An external pen lifter which can be operated from outside the case prevents inadvertent pen movement when the case is opened. A storage tab is provided for the calibration and clock winding key.

## APPLICATION

Can be used indoors, or outdoors when installed in an instrument shelter. Provides a 1-day or 7-day trace of relative humidity. The attractive styling and modern design will enhance an instrument display.

## SPECIFICATION

- Range ..... 0- 100% R.H.
- Sensor ..... Two human hair bundles
- Accuracy .....  $\pm 1\%$  between 20 and 80%  
approximately 3% at extremes
- Sensitivity ..... Less than 1%
- Chart Scale Divisions ..... 1%
- Chart Size ..... 11½"l x 3½"h
- Chart Drive ..... 8-day spring wound
- Drum Rotation ..... 1-day and 7-day  
(26 hr. & 172 hr.)  
by change gear provided
- Weight/Shipping ..... 9 lbs/14 lbs

## ORDERING SPECIFICATION

- H324 *Skyline* Hygrograph complete with pen, ink and 100 charts.
- H324-HB Replacement hair bundle, set of 2.

## CHARTS

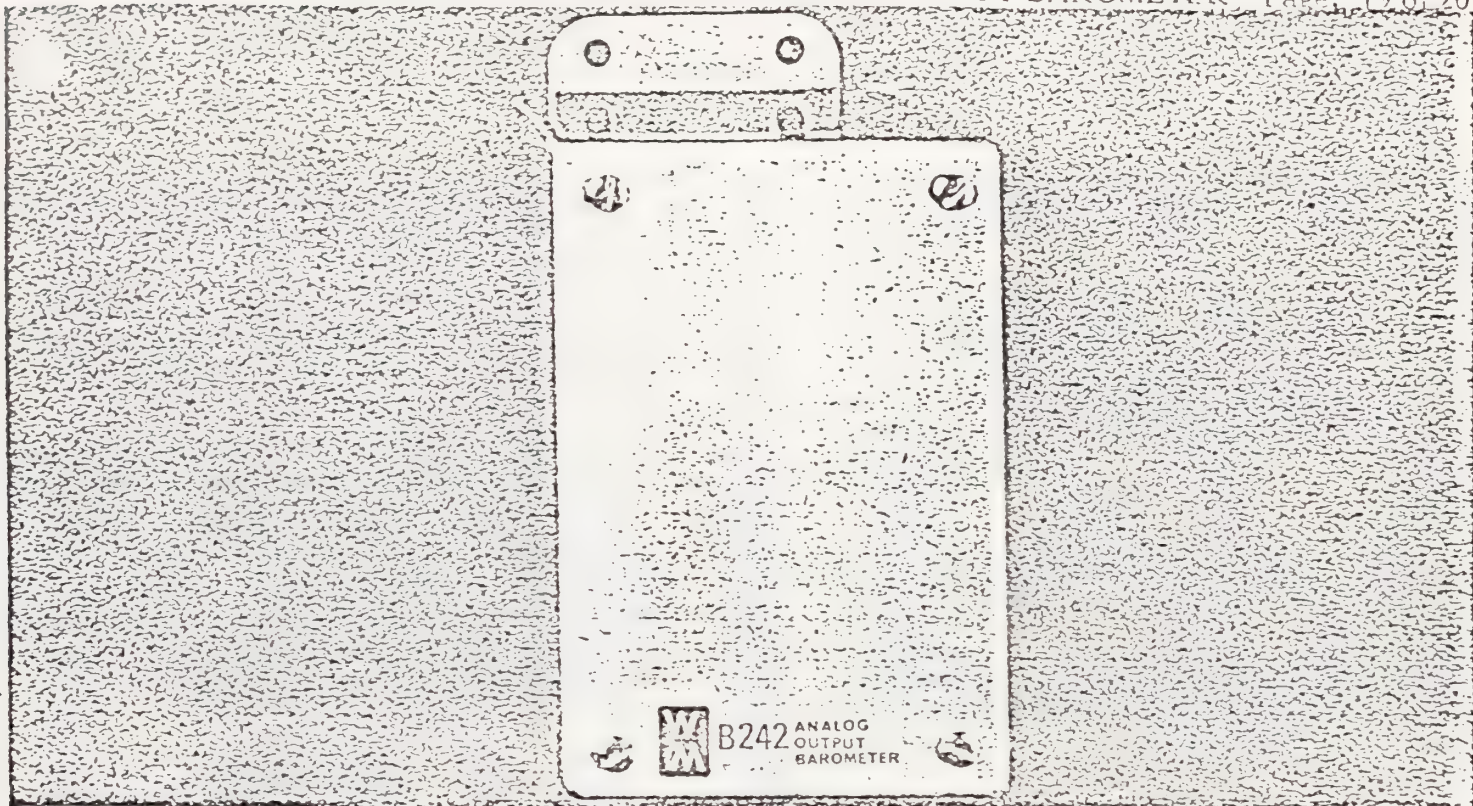
- C324-W 0 to 100% - 7-day drum rotation.
- C324-D 0 to 100% - 1-day drum rotation.

All Prices F.O.B. Sacramento

THIS INSTRUMENT IS AVAILABLE FOR LEASE —  
prices available on request.



## WEATHERMEASURE B242 ANALOG OUTPUT BAROMETER



## DESCRIPTION

The Model B242 Analog Output Barometer provides an output voltage that is linearly proportional to pressure. The analog output can be used for recording barometric pressure on digital data loggers, strip chart recorders, and for telemetry links, or other systems requiring an analog input signal of pressure.

The Model B242 contains a multicell aneroid sensor which positions the core of a linear variable differential transformer (LVDT). The output voltage of the LVDT, which is linear with core position (hence with pressure), is amplified to the level desired. All mechanical and electrical components are designed to achieve linearity and a low temperature coefficient. The aneroid cells are of NiSPAN-C and have a thermal expansion coefficient of essentially zero.

The gain and zero point of the amplifier may be adjusted to produce an output varying from 0 to 1 VDC over any 100 mb interval between 600 and 1065 mb. The gain is normally set at the factory and the zero point set in the field to correspond to the elevation of the installation.

The sensor housing is airtight and provided with a pressure fitting so that atmospheric pressure at remote locations or any other pressure in the range of 600 to 1065 mb (17.7 to 31.45" Hg) may be measured.

It is also available with other output voltages or for lower pressure levels as options.

## APPLICATION

The principal use of the Model B242 Analog Output Barometer is as the barometric pressure sensor for data loggers, strip chart recorders, telemetry and remote indicator systems. It is suitable for use at elevations to 12,000 ft.

## SPECIFICATIONS

- Range ..... Any 100 mb interval  
from 600 to 1065 mb (standard)
- Output ..... 0-1 VDC (standard)
- Resolution ..... Infinite
- Linearity .....  $\pm 0.5$  mb, over 100 mb intervals (0-40°C)  
 $\pm 1.0$  mb, over 100 mb interval (-20°C to +40°C)
- Ambient Temperature ..... -20 to 40°C
- Power ..... 115V, 50/60 Hz, or 12 VDC
- Size, Sensor Housing ..... 9" h x 5 1/2" w x 5 1/4" d
- Size, Electronics Housing ..... 6" h x 11 1/4" w x 6 1/4" d
- Weight, Total ..... 9 lbs.
- Shipping Weight ..... 18 lbs.

## ORDERING SPECIFICATIONS

- B242 ..... Analog Output Barometer, including sensor in housing, power supply and signal conditioning electronics in separate cabinet.
- B242-S ..... Analog Output Barometer, less power supply and signal conditioning.
- BD242-116 ..... Power Supply and signal conditioning circuit card.
- B242-C ..... Cable, 4 conductor, to connect sensor to electronics. All Prices F.O.B. Sacramento

All Prices F.O.B. Sacramento

**WEATHERMEASURE CORPORATION**

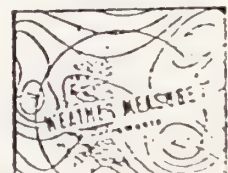
A Subsidiary of Systron-Donner Corp.

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TELEPHONE (916) 481-7565

II B-364

CABLE ADDRESS: WEATHER SACRAMENTO

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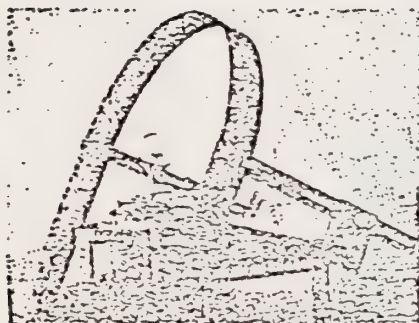


SPECIFICATIONS  
EPPLEY PRECISION SPECTRAL PYRANOMETER

Section No. A  
Revision No. 1  
Date: 6 June 1978  
Page 20 of 20



No. 646



No. 646C(1)



No. 646C(2)

**EPPLEY PRECISION SPECTRAL PYRANOMETER.** Designed for the measurement of sun and sky, totally or in defined wavelength bands, this instrument is an improved and smaller model of a device introduced in 1957. The sensing element, designed to withstand mechanical vibration and shock, is a wire-wound thermopile, mounted in a chromed brass case. Parsons' black lacquer, non-selective to different wavelengths, covers the receiver surface and overall are a pair of concentric hemispheres of Schott glass, removable and replaceable. The inner glass is clear WG7, transparent to wavelengths approx. 285/2,800nm. For the outer glass there is a choice: WG7, as above, or any of the following, with the centers of lower sharp cutoff approximately as noted: yellow GG14, 500nm; orange OG1, 530nm; red RG2, 630nm; dark red RG8, 700nm.

A white enameled guard disc fits above a cast bronze stand with adjustable leveling screws and a bubble type level—a desiccator that can be inspected is also supplied. Instrument characteristics include: Sensitivity, 5mV per cal./cm<sup>2</sup>min.; Impedance, 300 ohms; Temperature Compensation,  $\pm 1\%$  from  $-20/+40^{\circ}\text{C}$ .; Response, linear up to intensities of 4 cal./cm<sup>2</sup>min.; Response Time, for 66% change, 1 sec.; Mechanical Vibration, up to 20 g's.

Calibration reference is Eppley primary standard group of Angstrom pyheliometers reproducing International Pyrheliometric Scale. Wt. 5/ shpg. 13 lbs.

**Accessories:**

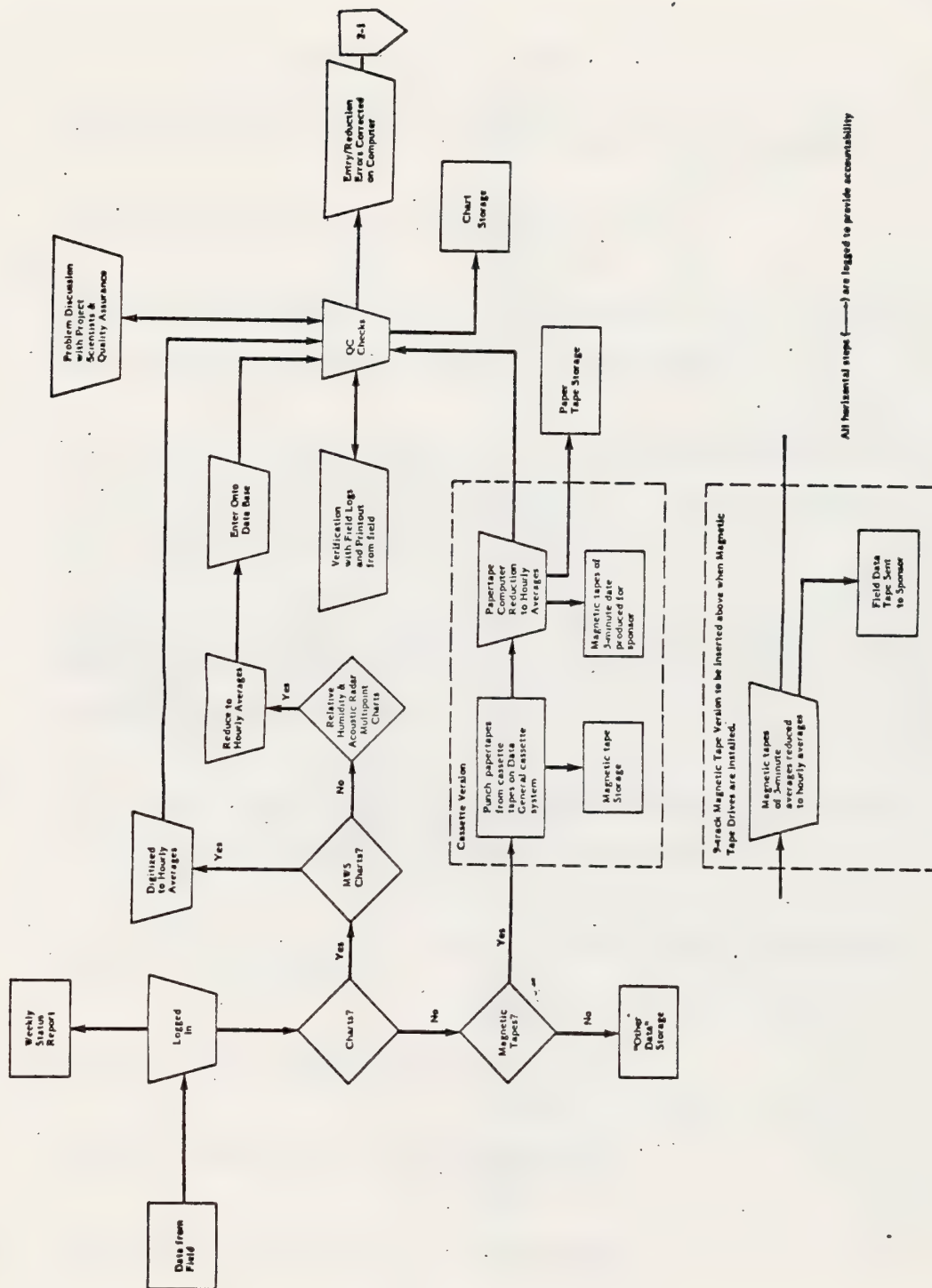
- A. Outer glass Schott filters, specify WG7, GG14, OG1, RG2, or RG8. Includes mount.
- B. Potentiometric recorders, see Nos. 643-1, 644
- C. Shadow bands with correction data for use with No. 646 or 645-48, (1) for latitude  $0/60^{\circ}$  N or S (2) for latitude  $60/95^{\circ}$  N or S.



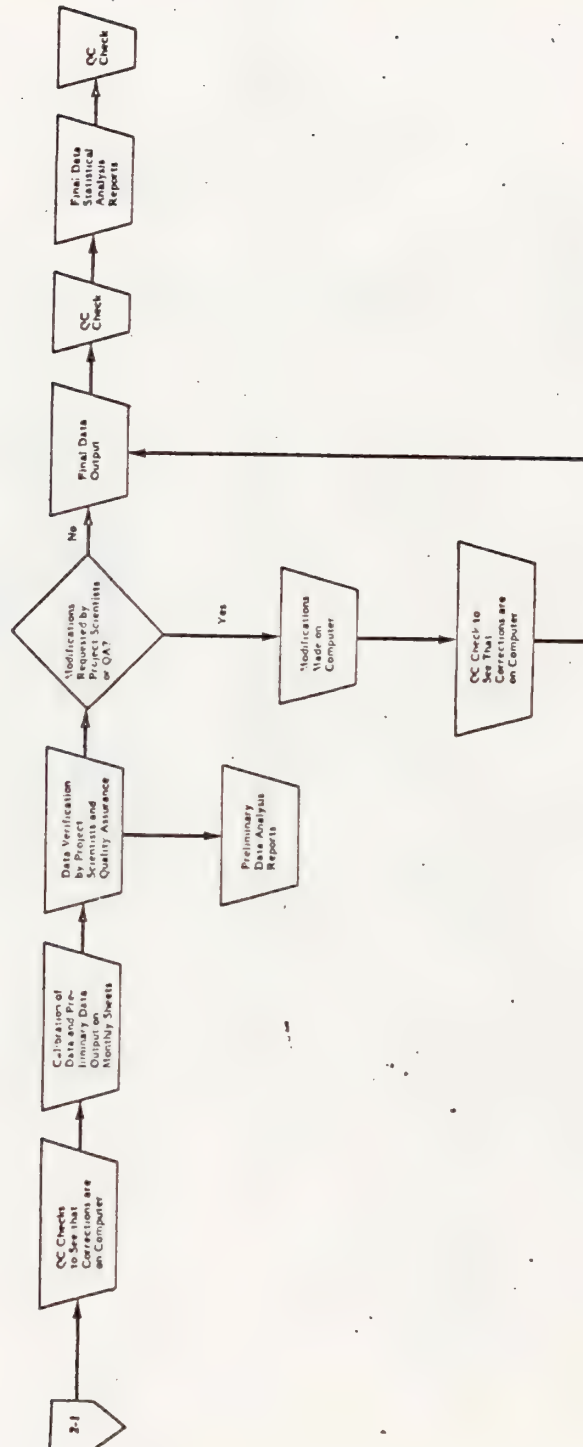
## APPENDIX B

Excerpt from AeroVironment's  
Data Reduction Manual

176.9 Cb Oil Shale Project Data Processing Flow Diagram.







176.10     Standard Data Procedures for Cb Shale Oil Project

The following is the standard monthly flow of data arriving from Cb:

(Cassette Data Reduction) (September 1977-January 1978)

1.    The data arrives from the field and is logged in by a data clerk.
2.    Cassette tapes are sent to Computer Operations.
3.    Computer Operations converts the cassettes to paper tapes on the in-house Data General cassette computer system.
4.    The paper tapes are loaded onto the AQDMS data base and 5-minute averages are automatically stored on a 9-track magnetic tape. Hourly averages are stored on the data base.
5.    Printouts of the data hourly averages are made which are spot checked against the 30 minute averages on the Texas Instruments Silent 700 printout which arrives from the field.
6.    The station logs are scanned by a data technician to look for power outages, instrument malfunctions, and the like.
7.    Corrections determined in steps 5 and 6 above have been made to the hourly averaged data.
8.    Quality Assurance personnel verify the data.
9.    Monthly calibrations are applied to the data.
10.   Quality Assurance personnel verify the data.
11.   Monthly reports are produced from the data, along with a data tape of hourly averages.

(9-Track Magnetic Tape Reduction) (Scheduled to start in May 1978)

When the 9-track drives are installed these changes will be made to the above:

2. Magnetic tapes are sent to Computer Operations.
3. eliminated
4. The magnetic tapes are converted into hourly averages as they are loaded onto the AQDMS data base. The field tape is sent to the sponsor.

(Multipoint Reduction) (started in January 1978)

When the multipoints are installed and the cassette system is not recording data, these changes will be made to the above procedure:

2. eliminated
3. The multipointed are reduced to hourly averages by hand and entered onto paper tape.
4. The paper tapes are loaded onto the AQDMS data base and stored as hourly averages.
5. Printouts of the data hourly averages are made.

176.11 Specific Techniques

These are specific techniques which are used to produce various reports:

#### 176.11.1 Wind Direction Averages

Wind direction is averaged by the computer by using standard vector addition except that wind speed is assumed to be one (unit vector addition). The wind direction hourly averages are computed from five-minute averages (as are the other components).

#### 176.11.2 Missing Data Codes

Missing data is replaced with a letter code describing why the data is missing. The letter codes are:

- CA Calibration (calibration, system check)
- MT Maintenance (changing paper, tape, charcoal)
- FO Flame out (on the GC-THC,HC, CH<sub>4</sub>, CO, SO<sub>2</sub>, H<sub>2</sub>S, Total Sulfur)
- IM Instrument malfunction (instrument failures)
- PF Power failure (generator failure)
- RF Recording sytem failure (chart jams, runs out)
- LI Local interference (car nearby)
- OE Operator error (field tech leaves switch in wrong position, out of AV's control)
- OS Off scale (at top of chart)
- IN Interference (CO<sub>2</sub> interference on sulfur data, SO<sub>2</sub> interference in oxidant readings).
- SE Special experiment (instrument removed for tracer study, etc.)
- OR Out for repair (instrument removed from site with no replacement)
- VA Variable wind direction
- CM Calm (no wind direction when wind speed = 0).
- UN Unlimited ceiling (reported to NWS Stations)  
Blank (causes a blank to be printed as in the beginning of a new month before a component starts).



176.12     Report Listing

The following is a listing of the monthly data reports' contents (from the AV Statement of Work). Some of the reports are combined on a single page.

## MONTHLY REPORT CONTENTS

- A: Air Quality and Meteorological Data
1. Hourly tables by parameter by site
  2. Downtime hours by parameter by site
  3. Monthly % efficiency by parameter by site
  4. Hourly tables of stability class determined by  $\Delta T$
  5. Five maximum independent sliding averages (1, 3, 8, 24 hours, as appropriate) with corresponding WS/WD for those parameters with a NAAQS air quality standard ( $O_3$  - 1 hour/ CO - 1 hour and 8-hour;  $SO_2$  - 3-hour, 24-hour; particulates - 24-hour; Hc ( $CH_4$  reduced) - 3 hours (6-9 a.m.) ).
  6. Monthly and daily averages
  7. Descriptive regional meteorological summary
- B: Acoustic radar hourly mixing height, inversion height, and stability type.
- C: System description - initial report and again after major changes
- D: Data acceptance algorithm
- E: Pibal data utilizing a double theodolite presenting wind speed, wind direction, and temperature versus altitude.

#### 1.2.4      Data Problem Reporting

Whenever a problem is noticed in any data, or should data be missing, then a "Data Processing Problem Report" is used. It notifies the Project Manager that there is a problem, tells him what action DP is taking (even if there is no action) and finally allows him to decide the best manner to handle the problem.

A Problem Report and the "Data Problem Reporting Flow" are attached as a reference.

Data Processing

Project \_\_\_\_\_ Site \_\_\_\_\_ Component(s) \_\_\_\_\_ Section No. B  
 Revision No. 2  
 Period of Time Affected: \_\_\_\_\_ Date: 18 April 1978  
 Page 9 of 10  
 Problem: \_\_\_\_\_

DP Action Being Taken: \_\_\_\_\_

By: \_\_\_\_\_ DP Release: \_\_\_\_\_

Project Management

Assigned to: \_\_\_\_\_

List:	Actions Taken	Dates	Initials

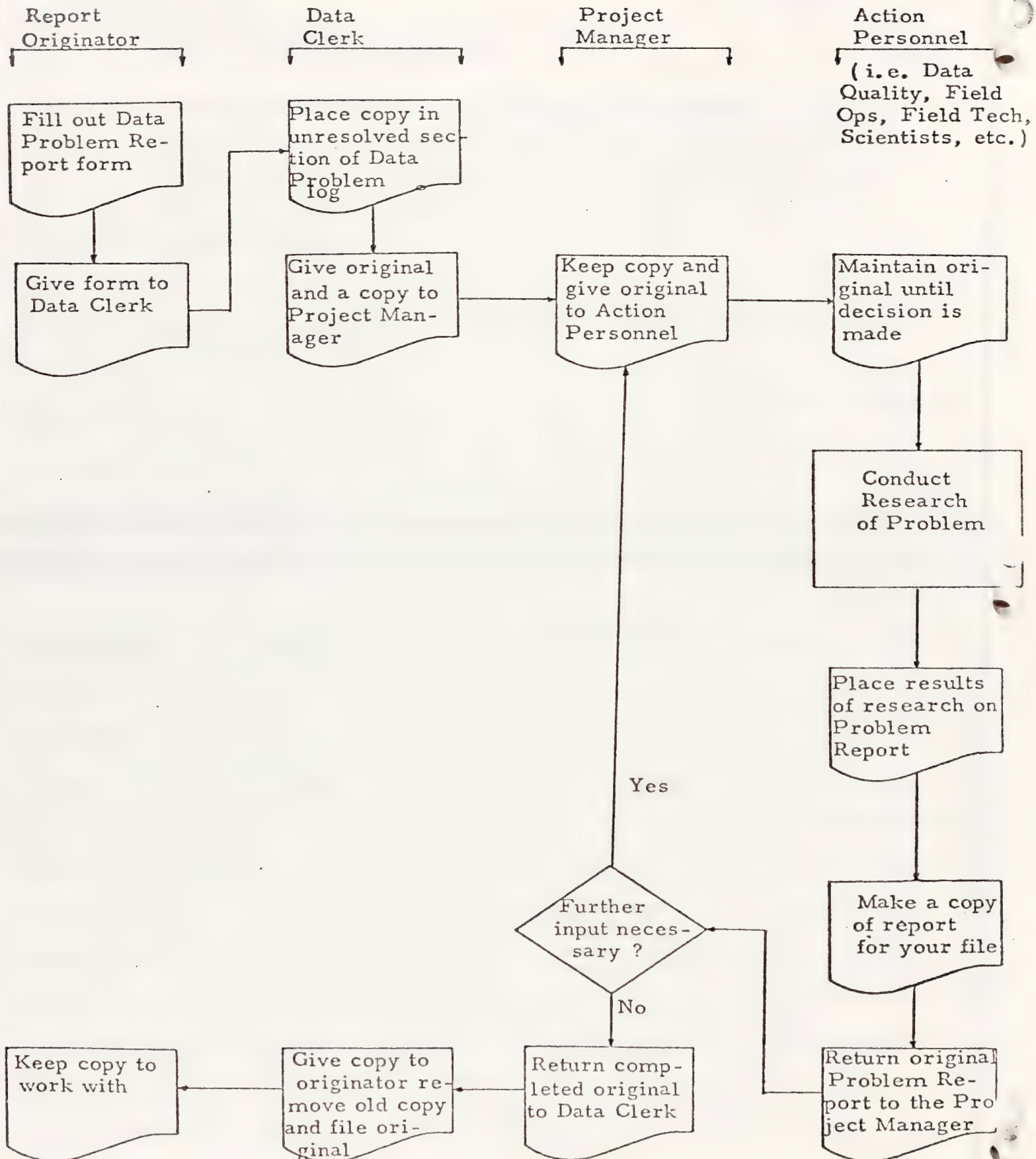
DP Instructions: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Project Manager Okay: \_\_\_\_\_ Date \_\_\_\_\_



# Data Problem Reporting Flow

Section No. B  
Revision No. 2  
Date: 18 April 1978  
Page 10 of 10



## APPENDIX C

## AeroVironment's Calibration Records

<u>Parameter</u>	<u>Pages</u>
NO/NO <sub>x</sub>	3
SO <sub>2</sub>	3
O <sub>3</sub>	2
THC/CH <sub>4</sub> /CO	3

# NO/NO<sub>x</sub>

## CALIBRATION RECORD

Section No. C  
Revision No. 0  
Date: 4 November 1977  
Page 1 of 11

Date \_\_\_\_\_ Location/Site No. \_\_\_\_\_

Trailer S/N \_\_\_\_\_ Time \_\_\_\_\_ Hrs. - \_\_\_\_\_ Hrs.

### Chemiluminescent NO/NO<sub>x</sub> Analyzer

Make \_\_\_\_\_ Model \_\_\_\_\_

S/N \_\_\_\_\_

#### Indicated Flow:

NO<sub>x</sub> sample \_\_\_\_\_ cc/min

NO sample \_\_\_\_\_ cc/min

O<sub>3</sub> \_\_\_\_\_ cc/min

Vacuum \_\_\_\_\_ in Hg

#### Settings:

NO <sub>x</sub>	NO	NO <sub>2</sub>	NO <sub>x</sub>	NO	NO <sub>2</sub>
at start			at completion		

Zero \_\_\_\_\_

Span \_\_\_\_\_

#### Test readout:

NO <sub>x</sub>	NO	NO <sub>2</sub>	NO <sub>x</sub>	NO	NO <sub>2</sub>
at start			at completion		

Electrical % \_\_\_\_\_

Optical ppm \_\_\_\_\_

Converter Efficiency: \_\_\_\_\_ %

Calibration Method: Zero: \_\_\_\_\_

Span: \_\_\_\_\_

Calibration Equipment Serial Number \_\_\_\_\_

Calibration Gas:

Cylinder Number \_\_\_\_\_ Analysis Date: \_\_\_\_\_

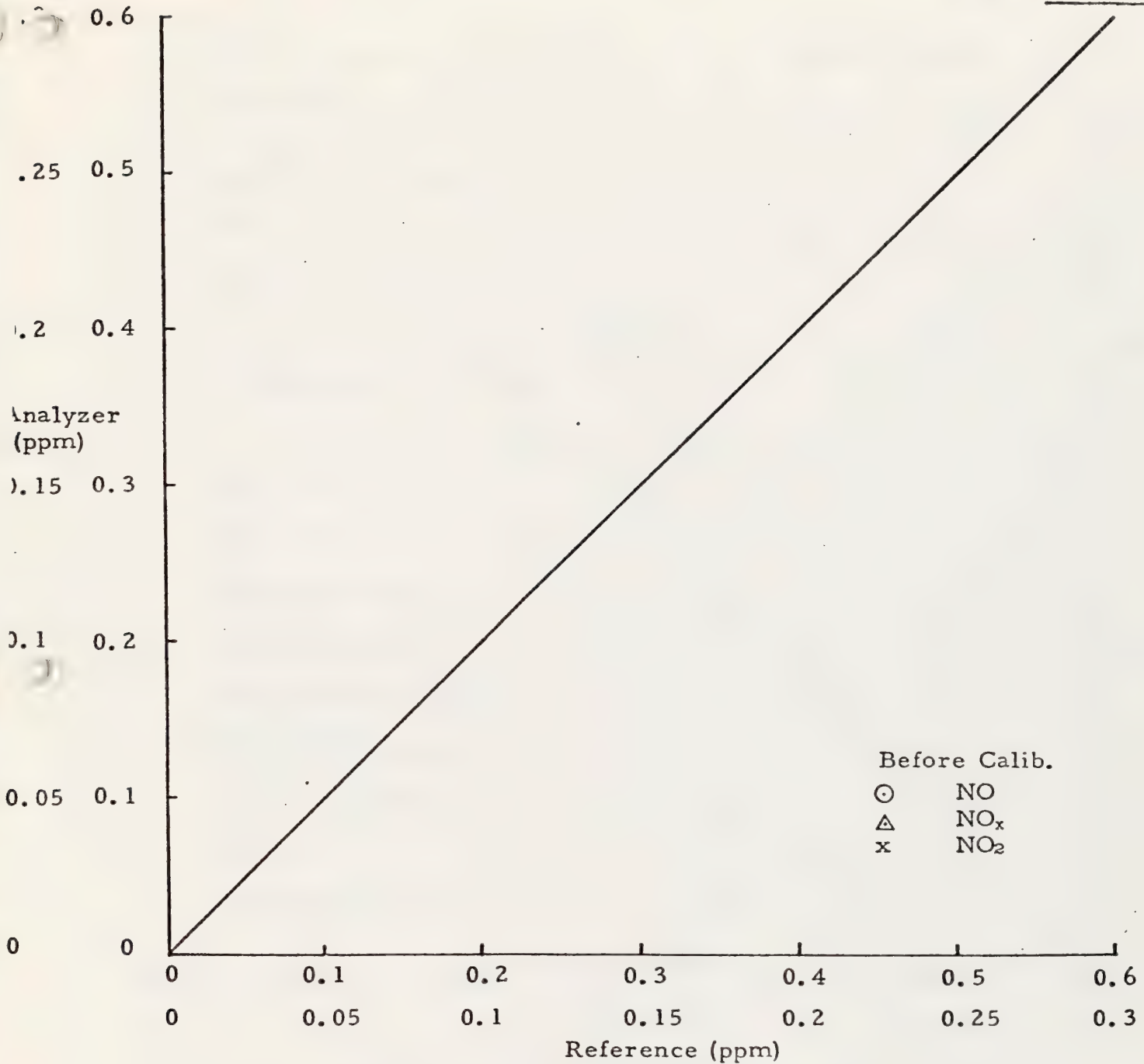
Analysis: \_\_\_\_\_

Calibrated by: \_\_\_\_\_

Comments: \_\_\_\_\_

# CALIBRATION CHART

Date \_\_\_\_\_ Location \_\_\_\_\_ Trailer \_\_\_\_\_  
 Chemiluminescent NO/NO<sub>x</sub> Analyzer Make \_\_\_\_\_ Model \_\_\_\_\_ S/N \_\_\_\_\_  
 Section No. C  
 Revision No. 0  
 Date: 4 November 1978  
 Page 2 of 11



REFERENCE BASE (give 0 and minimum 2 points)

Flow Setting	Press. psig	NO in ppm	NO <sub>2</sub> in ppm	NO read ppm	NO <sub>x</sub> read ppm	NO <sub>2</sub> read ppm	Remarks



# CALIBRATION CHART

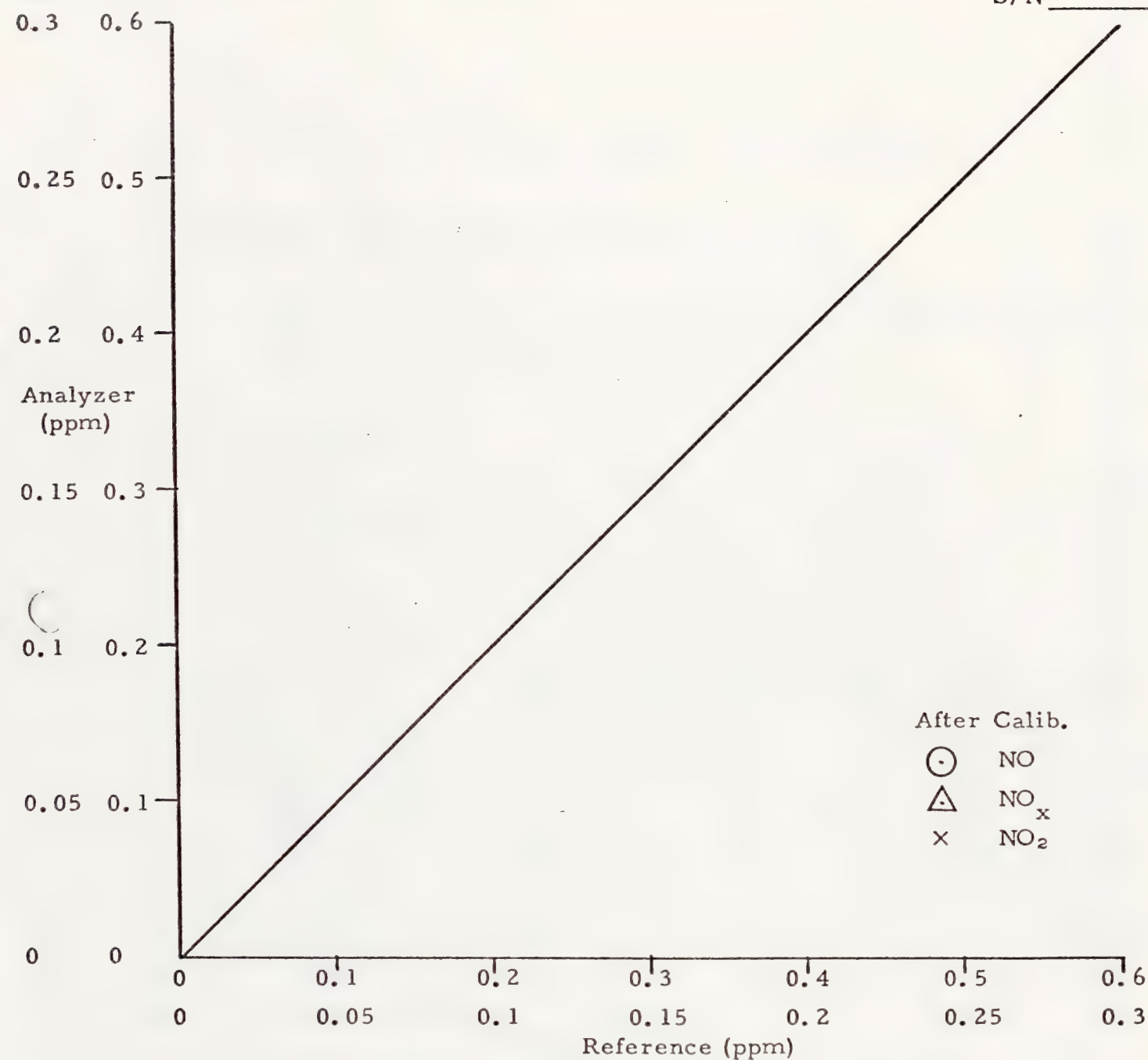
Revision No. 0

Date: 4 November 1977

Date \_\_\_\_\_ Location \_\_\_\_\_ Trailer S/N \_\_\_\_\_ Page 3 of \_\_\_\_\_ Site No. \_\_\_\_\_

Chemiluminescent NO/NO<sub>x</sub> Analyzer Make \_\_\_\_\_ Model \_\_\_\_\_

S/N \_\_\_\_\_



REFERENCE BASE (give 0 and minimum 2 points)

Flow Setting	Press. psig	NO in ppm	NO <sub>2</sub> in ppm	NO read ppm	NO <sub>x</sub> read ppm	NO <sub>2</sub> read ppm	Remarks

# SO<sub>2</sub>

## CALIBRATION RECORD

Section No. C  
Revision No. 0  
Date: 4 November 1977  
Page 4 of 11

Date \_\_\_\_\_

Location/Site No. \_\_\_\_\_

Shelter S/N \_\_\_\_\_

Time \_\_\_\_\_ Hrs. - \_\_\_\_\_ Hrs.

### Sulfur Dioxide Analyzer

Make \_\_\_\_\_

Model \_\_\_\_\_

S/N \_\_\_\_\_

	<u>BEFORE</u>	<u>AFTER</u>
Flow settings		
air	_____	_____
H <sub>2</sub>	_____	_____
Zero setting	_____	_____
Span setting	_____	_____
High Voltage Supply	_____	V _____
Oven Temperature	_____	°C _____
Burner Block Temperature	_____	°C _____
Exhaust Temperature	_____	°C _____
H <sub>2</sub> S Scrubber Efficiency:	_____ %	
Calibrator:	_____	S/N _____
Calibration Method:	Zero	_____
SO <sub>2</sub> Perm. Tube No.		_____
H <sub>2</sub> S Perm. Tube No.		_____
Temperature		_____ ± _____ °C

Calibrated by: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

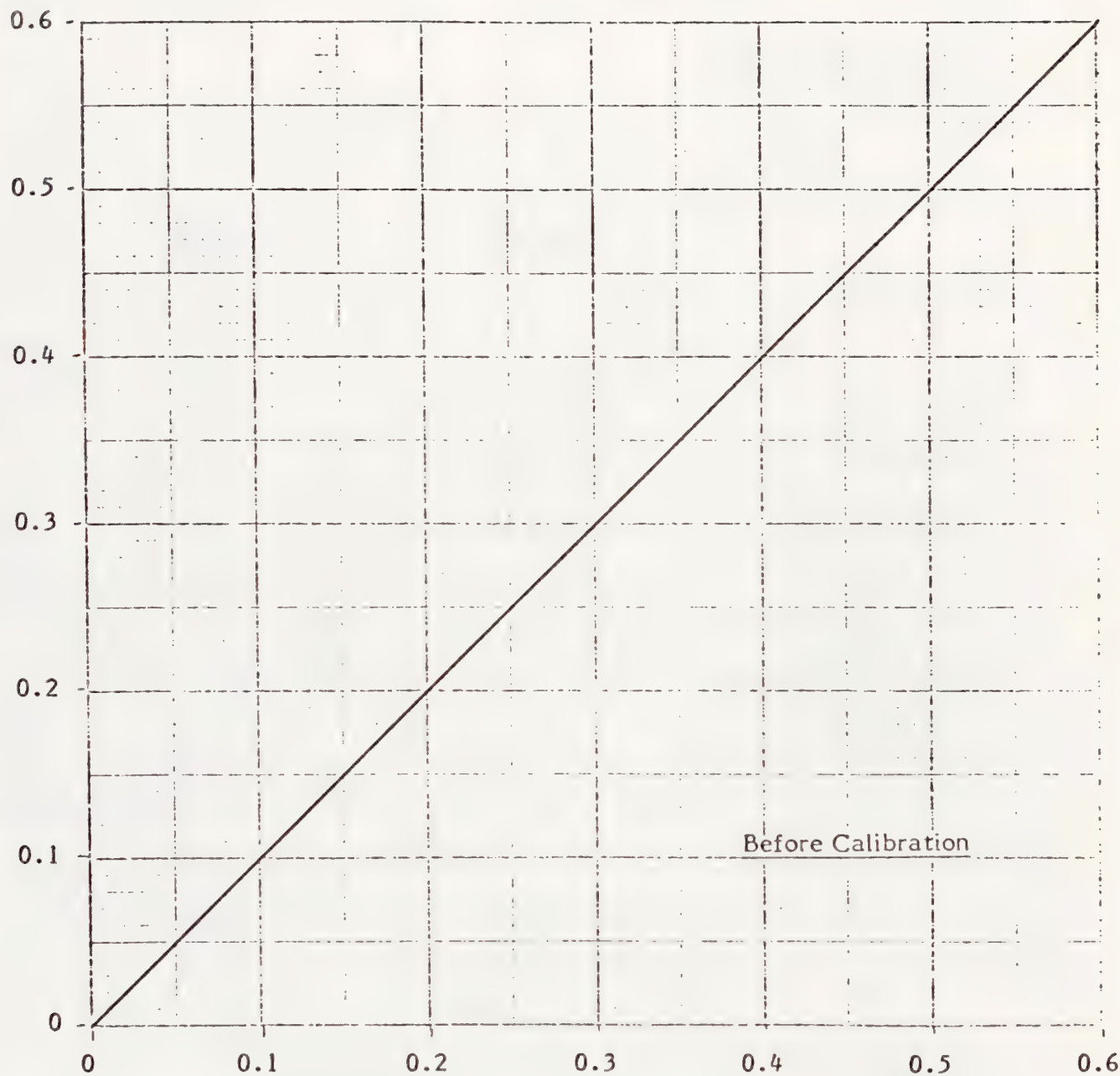
# SO<sub>2</sub>

## CALIBRATION CHART

Section No. C  
Revision No. 0  
Date: 4 November 1977  
Page 5 of 11

Date \_\_\_\_\_ Location \_\_\_\_\_ Shelter S/N \_\_\_\_\_ Site No. \_\_\_\_\_

Sulfur Dioxide Analyzer Make \_\_\_\_\_ Model \_\_\_\_\_ S/N \_\_\_\_\_



REFERENCE BASE (Give 0 and 5 span points)

Flow Setting	SO <sub>2</sub> in ppm	H <sub>2</sub> S in ppm	SO <sub>2</sub> read, ppm	Remarks

II B-382

AV-F-FO40



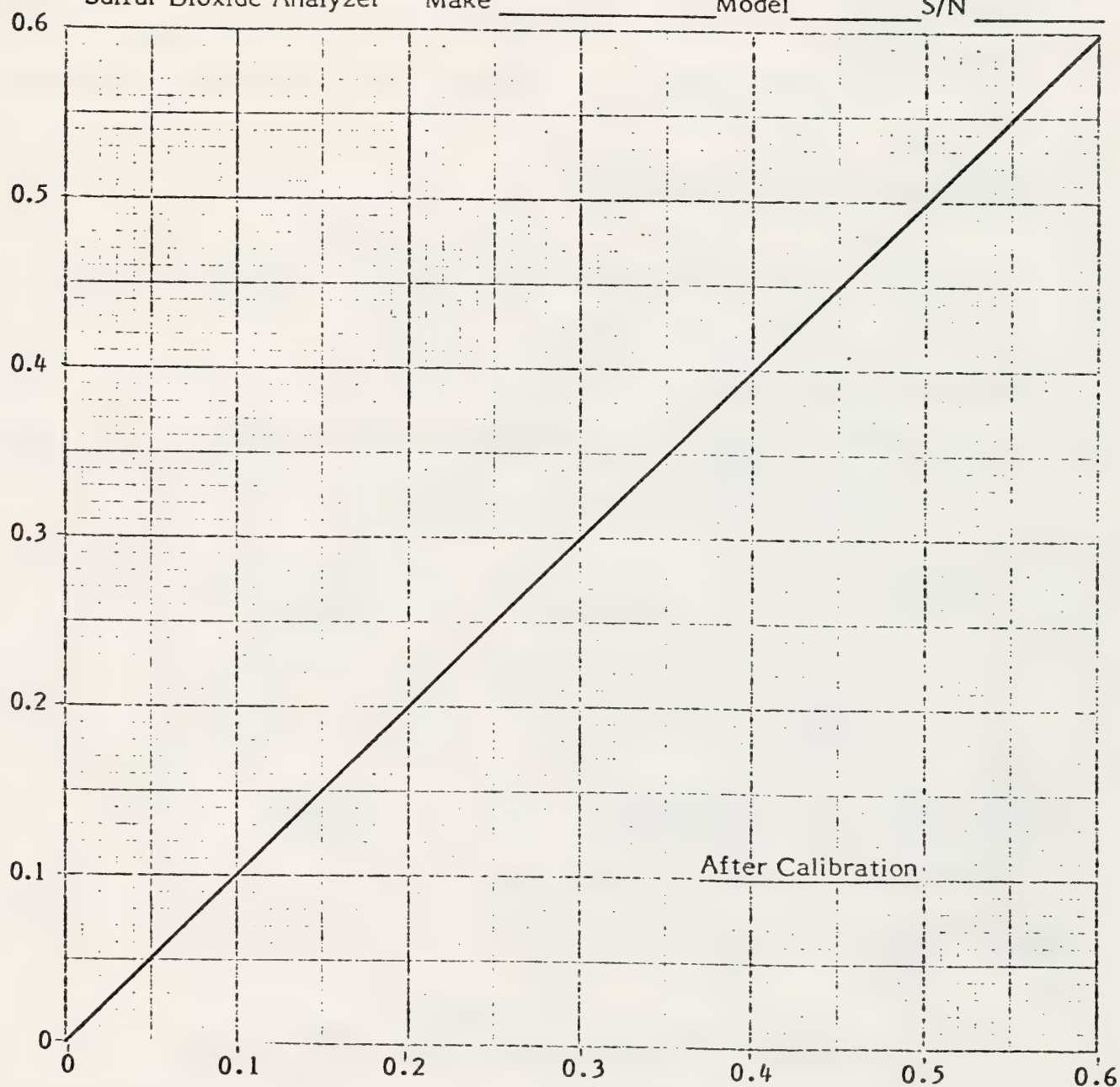
# SO<sub>2</sub>

## CALIBRATION CHART

Section No. C  
Revision No. 0  
Date: 4 November 1977  
Page 6 of 11

Date \_\_\_\_\_ Location \_\_\_\_\_ Shelter S/N \_\_\_\_\_ Site No. \_\_\_\_\_

Sulfur Dioxide Analyzer Make \_\_\_\_\_ Model \_\_\_\_\_ S/N \_\_\_\_\_



Reference, ppm  
REFERENCE BASE (Give 0 and 5 span points)

Flow Setting	SO <sub>2</sub> in ppm	H <sub>2</sub> S in ppm	SO <sub>2</sub> read, ppm	Remarks

O<sub>3</sub>

CALIBRATION RECORD

Date \_\_\_\_\_ Location/Site No. \_\_\_\_\_

Trailer S/N \_\_\_\_\_ Time \_\_\_\_\_ Hrs. \_\_\_\_\_ Hrs. \_\_\_\_\_

Chemiluminescent O<sub>3</sub> Analyzer

Make \_\_\_\_\_ Model \_\_\_\_\_

S/N \_\_\_\_\_

Indicated Flows:

C<sub>2</sub>H<sub>2</sub> \_\_\_\_\_ cc/min at inlet pressure \_\_\_\_\_ psig

Sample + C<sub>2</sub>H<sub>2</sub> \_\_\_\_\_ cc/min

Settings:

BEFORE

AFTER

Zero \_\_\_\_\_

Span \_\_\_\_\_

Test:

BEFORE

AFTER

Electrical % \_\_\_\_\_

Optical ppm \_\_\_\_\_

Calibration Method: Zero \_\_\_\_\_

Span \_\_\_\_\_

Calibration Equipment Serial Number \_\_\_\_\_

Calibrated by: \_\_\_\_\_

Comments: \_\_\_\_\_



# THC/CH<sub>4</sub>/CO

Section No. C  
Revision No. 0  
Date: 4 November 1977  
Page 9 of 11

## CALIBRATION RECORD

Date \_\_\_\_\_ Location/Site No. \_\_\_\_\_

Trailer S/N \_\_\_\_\_ Time \_\_\_\_\_ Hrs. - \_\_\_\_\_ Hrs.

HC/CO Gas Chromatograph:

Make \_\_\_\_\_ Model \_\_\_\_\_ S/N \_\_\_\_\_

Pressures:		BEFORE	AFTER	
	H <sub>2</sub> fuel			psig
	Burner air			psig
	Air carrier			psig
	Service Air			psig
	H <sub>2</sub> carrier			psig

Timing:		BEFORE		AFTER		
		On	Off	On	Off	
	Valve B					Sec
	Component 1 (THC)					"
	Valve A					"
	Auto Zero A					"
	Component 2 (CH <sub>4</sub> )					"
	Auto Zero B					"
	Component 3 (CO)					"

Calibration Gas:

Cylinder Number \_\_\_\_\_ Analysis Date: \_\_\_\_\_

Analysis: THC \_\_\_\_\_, CH<sub>4</sub> \_\_\_\_\_, CO \_\_\_\_\_

Calibrated by: \_\_\_\_\_

Comments: \_\_\_\_\_

Attach manual and automatic chromatograms.



# CALIBRATION CHART

Date \_\_\_\_\_ Location \_\_\_\_\_ Trailer S/N \_\_\_\_\_ Site \_\_\_\_\_

HC/CO Gas Chromatograph

Make \_\_\_\_\_

Model \_\_\_\_\_

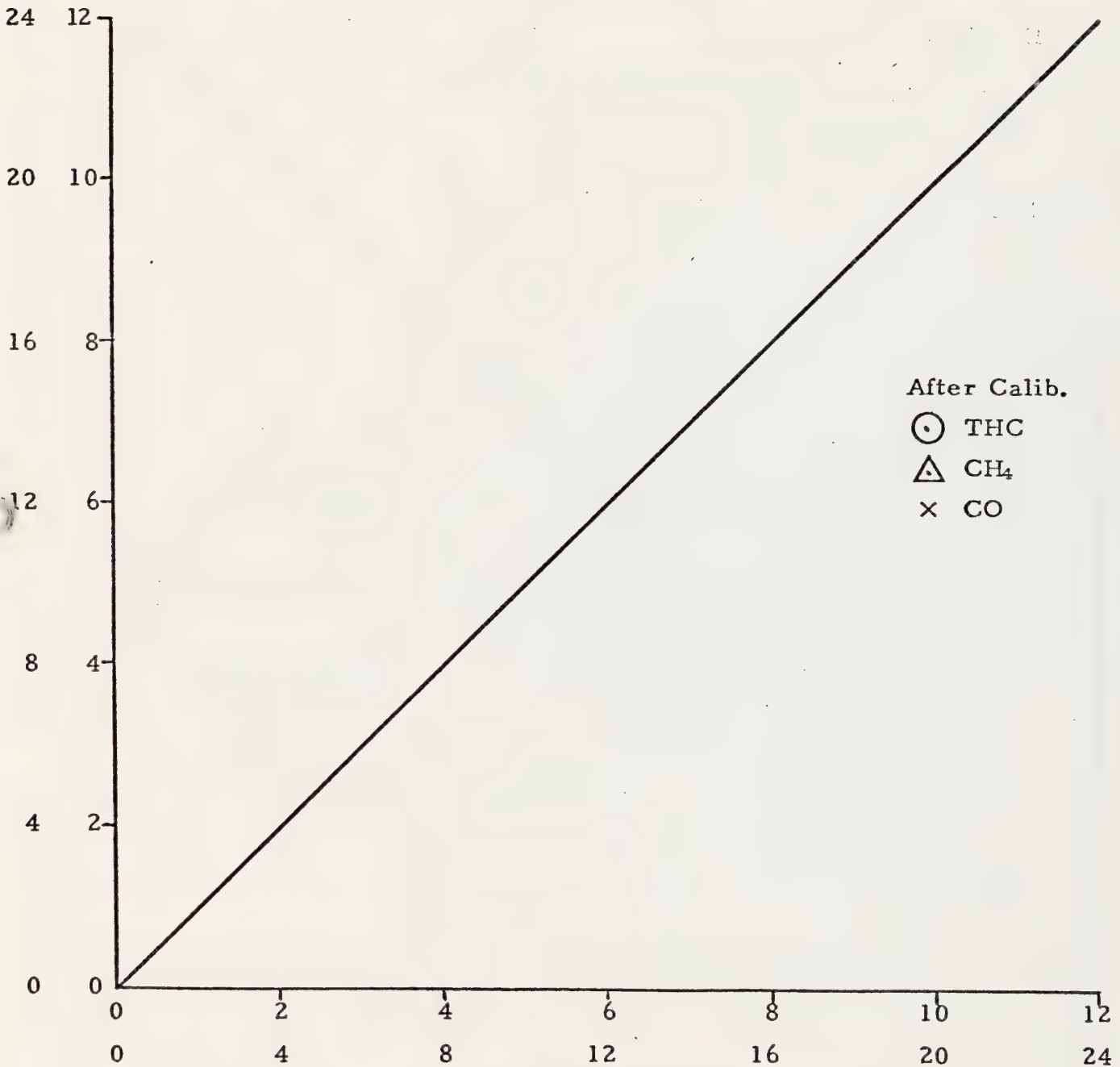
S/N \_\_\_\_\_

Section No. C

Revision No. 0

Date: 4 November 1977

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Calibration Gas (ppm)

Calib. Base	Span	Zero	Remarks
THC ppm			
CH <sub>4</sub> ppm			
CO ppm			

II B-387

# CALIBRATION CHART

Date \_\_\_\_\_ Location \_\_\_\_\_ Trailer S/N \_\_\_\_\_ Site \_\_\_\_\_

HC/CO Gas Chromatograph

Make \_\_\_\_\_ Model \_\_\_\_\_

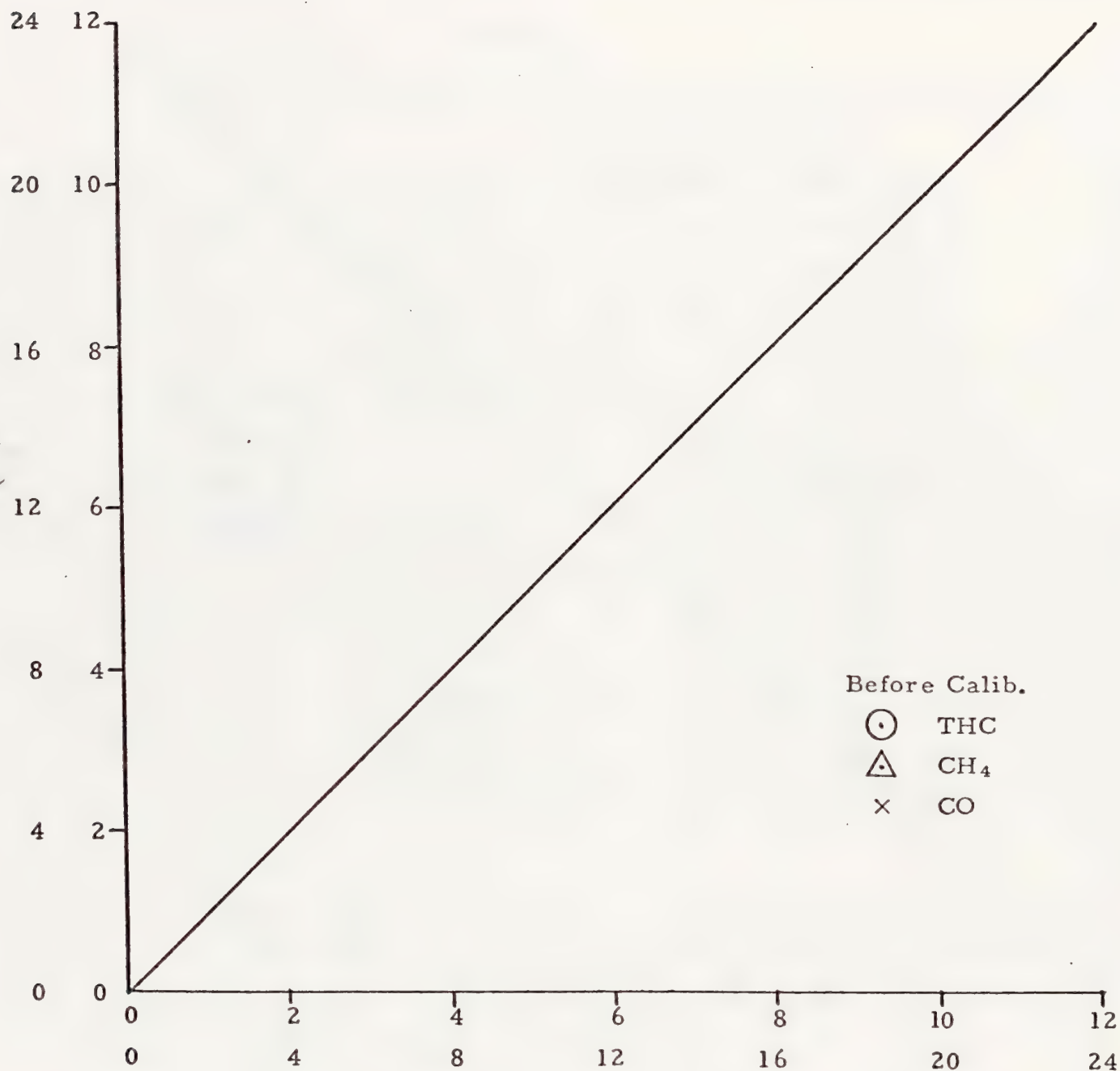
S/N \_\_\_\_\_

Section No. C

Revision No. 0

Date: 4 November 1978

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Calibration Gas (ppm)

Calib. Base	Span	Zero	Remarks
THC ppm			
CH <sub>4</sub> ppm			
CO ppm			

II B-388

AV-F-F011

APPENDIX D

AeroVironment Daily Check List

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0

# CALIBRATION CHART

Date \_\_\_\_\_ Location \_\_\_\_\_ Trailer S/N \_\_\_\_\_ Site \_\_\_\_\_

HC/CO Gas Chromatograph

Make \_\_\_\_\_ Model \_\_\_\_\_

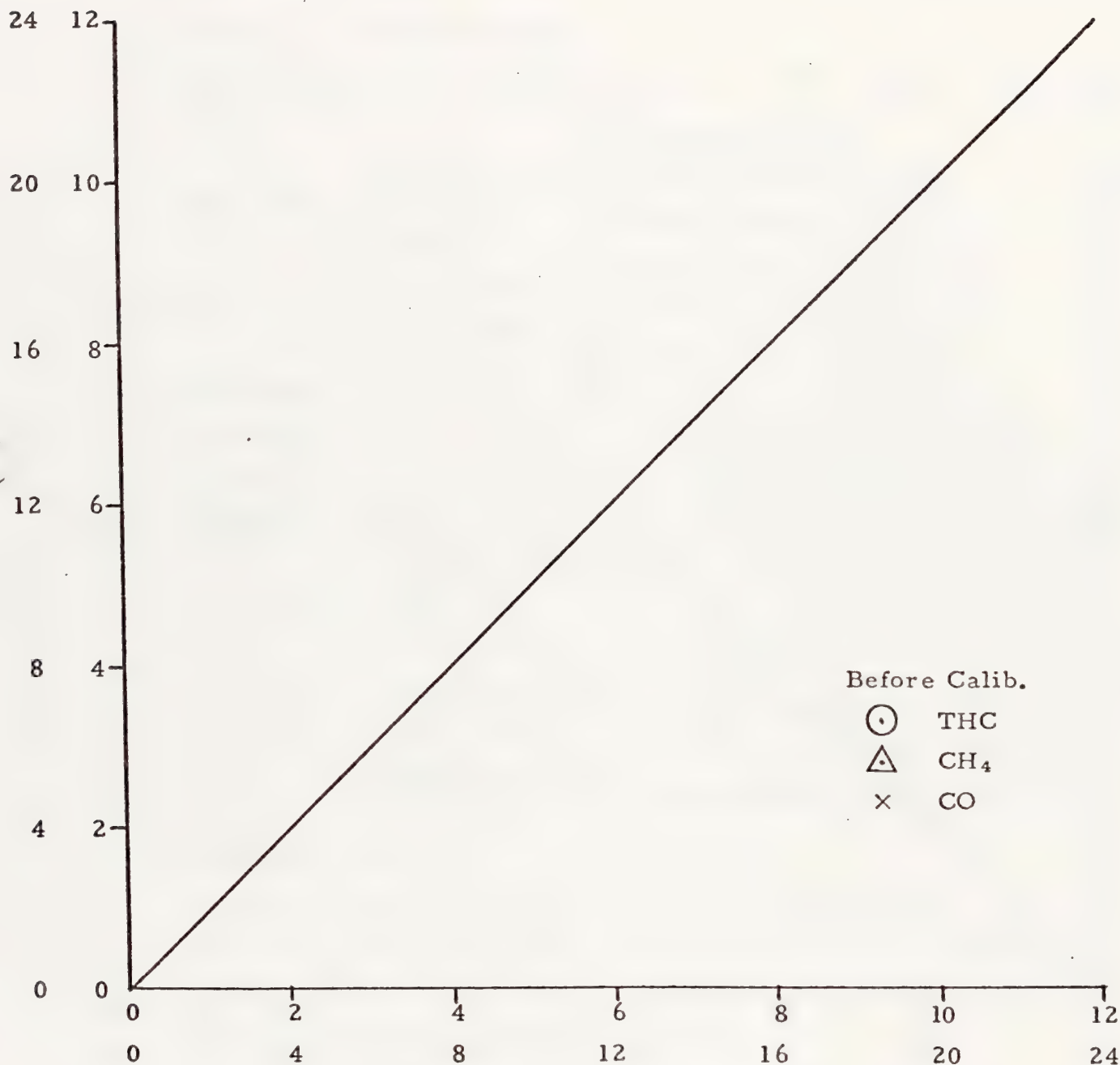
S/N \_\_\_\_\_

Section No. C

Revision No. 0

Date: 4 November 1978

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Calib. Base	Span	Zero	Remarks
THC ppm			
CH <sub>4</sub> ppm			
CO ppm			

II B-388

AV-F-F011



## APPENDIX D

### AeroVironment Daily Check List

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0

SUBJECT		ITEM	REFERENCE	TOLER.	STATION CHECK										
					1	2	3	4	5	6	7	8	9	10	
GENERAL	Day		-												
	Time		MST	-											
	Temp. min. /max.		68° F/86° F	-											
	Glass Wool		Clean	✓											
GAS SUPPLY	HC H <sub>2</sub> Supply		>500 psig	-											
	Sulfur H <sub>2</sub> Supply		>500 psig	-											
	Ethylene (C <sub>2</sub> H <sub>4</sub> )		>100 psig	-											
	Nitric Oxide (NO)		>500 psig	-											
	HC/CO Cal Gas-High		>200 psig	-											
	HC/CO Cal Gas-Low		>200 psig	-											
RECORDER	HC/CO Clean Air System		Operational	-											
	Trace		Clear	✓											
	Time Marking		-	✓											
	Chart Change?		End-of-chart indicator	-											
NO/NO <sub>x</sub> ANALYZER	Status		Operational	-											
	Vacuum		in Hg												

HH B-390

NO/NO<sub>x</sub> ANALYZER  
(continued)

Oven Temp.	Regulated	-							
Drying Cartridge	>2"	-							
NO/NO <sub>x</sub> Range	0.5/0.5 ppm	-							
Last Zero/Span Time	MST	-							
Last NO Zero	ppb								
Last NO <sub>x</sub> Zero	ppb								
Last NO Span	ppb								
Last NO <sub>x</sub> Span	ppb								
Data Comparison Meter/Computer/Chart	Agree	-							
Status	Operational	-							
Range	0.5 ppm	-							
Air Flow	1pm	-							
C <sub>2</sub> H <sub>4</sub> Pressure	psig	-							
Last Zero/Span Time	MST	-							
Last Zero	ppb								
Last Span	ppb								
Data Comparison Meter/Computer/Chart	Agree								
Status	Operational	-							
Air Flow		-							
H <sub>2</sub> Flow		-							

O<sub>3</sub> ANALYZER

II B-391

SO<sub>2</sub> ANALYZER



Date: 5 December 1977  
Page 3 of 5

SO <sub>2</sub> ANALYZER (continued)	Flame	On	-						
	Test	%	-						
	Last Zero/Span Time	MST	-						
	Last Zero	ppb							
	Last Span	ppb							
	Data Comparison Meter/Computer/Chart	Agree	-						
H <sub>2</sub> S ANALYZER	Status	Operational	-						
	Air Flow		-						
	H <sub>2</sub> Flow		-						
	Flame	On	-						
	Test	%	-						
	Last Zero/Span Time	MST	-						
	Last Zero	ppb							
	Last Span	ppb							
	Data Comparison Meter/Computer/Chart	Agree							
	Status	Operational							
THC/CH <sub>4</sub> /CO ANALYZER	Carrier Flow								
	Sample Flow								
	Burner Air Flow								



THC/CH <sub>4</sub> /CO ANALYZER  (continued)	H <sub>2</sub> Pressure																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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[illegible]

APPENDIX E

AeroVironment Data Quality

Control Chart

INSTRUCTIONS FOR FORM FO47

(DATA QUALITY CONTROL CHART)

- I. Fill in project, site, parameter, instrument and unit of measure.  
Use one sheet for each parameter.
- II. Enter date and record the span and zero readings for that date.
- III. Enter average by averaging the readings of that date and the previous date.
- IV. Plot the calculated span and zero averages on the span average and zero average charts, respectively.
- V. Make an entry in the remarks column, in abbreviation, and in the station log in more detail, a description of any corrective action performed. Abbreviations such as CA for calibration and MT for maintenance are sufficient. No entry is necessary when no action is required.

INTERPRETATION OF CONTROL

1. The instrument is out-of-control when any of the following situations arise:
  - a. One or more points outside the upper control limit (UCL) or lower control limit (LCL).
  - b. A run of 2 or more consecutive points outside the upper warning limit (UWL) or lower warning limit (LWL).
  - c. A run of 7 or more consecutive points in a non-random manner. This might be a run up or run down or simply a run above or below the central line on the control chart.
  - d. Cycles or other non-random patterns in the data.
2. When the instrument is out-of-control, corrective action such as calibration, maintenance, repair, etc. is required.

NOTE: An example is given on the following page to depict the above mentioned instructions and interpretations.



# DATA QUALITY CONTROL CHART

Section No. E  
Revision No. 0  
Date: 4 November 1977  
Page 2 of 2

Project \_\_\_\_\_

Parameter \_\_\_\_\_

Site \_\_\_\_\_

Instrument \_\_\_\_\_

Technician \_\_\_\_\_

Unit of Measure \_\_\_\_\_

Date																			
SPAN	Read																		
	Avg.																		
ZERO	Read																		
	Avg.																		

SPAN AVERAGE																			

ZERO AVERAGE																			

Remarks																			
---------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

NOTE: ALL DETAILED REMARKS TO BE ENTERED IN THE STATION LOG

II B-397

AN 8 8047

APPENDIX F

Instrument Status Report Form



## C-b SHALE OIL VENTURE

## Weekly Air Monitoring System Status Report

Site No. 020 Reporting Date \_\_\_\_\_ By \_\_\_\_\_

Component	Status		Reason/Action	Service	
	O	NO		OUT	IN
Bendix G. C.					
Meloy SO <sub>2</sub>					
Meloy H <sub>2</sub> S					
Meloy O <sub>3</sub>					
M. L. NO/NO <sub>x</sub>					
Meloy Calibrator					
ML DAS 9300					
Kennedy Tape					
Multi-Point					
DAS					
Hi-Vol					
Acoustic Radar					
WS/WD - 10M					
Temp. 10M					
Other:					

STATUS: (O) Operational; (NO) Non-Operational, on reporting date.

[Note in reason/action column, all major NO status during week]

REASON/ACTION: Nature or cause of malfunction and recommended or performed action taken.

SERVICE: Date of malfunction (OUT) and expected date of return-to-service (IN).



## C-b SHALE OIL VENTURE

## Weekly Air Monitoring System Status Report

Site No. 023 Reporting Date \_\_\_\_\_ By \_\_\_\_\_

Component	Status		Reason/Action	Service	
	O	NO		OUT	IN
Bendix G. C.					
Meloy SO <sub>2</sub>					
Meloy H <sub>2</sub> S					
Meloy O <sub>3</sub>					
ML NO/NO <sub>x</sub>					
Meloy Calibrator					
ML DAS 9300					
Kennedy Tape					
Multi-Point #1					
Multi-Point #2					
Hygrometer					
Baro. Press.					
Solar Radiation					
Precipitation					
Hi-Vol					
WS/WD 10M					
30M					
60M					
Temp. 10M					
30M					
60M					
Delta-T 10M-60M					
Bi-Vane 10M					
60M					
Sigma-W 10M					
60M					
Other:					

STATUS: (O) Operational; (NO) Non-Operational, on reporting date.

[Note in reason/action column, all major NO status during week]

REASON/ACTION: Nature or cause of malfunction and recommended or performed action taken. II B-400

SERVICE: Date of malfunction (OUT) and expected date of return-to-service (IN).



## C-b SHALE OIL VENTURE

## Weekly Air Monitoring System Status Report

Site No. 024 Reporting Date \_\_\_\_\_ By \_\_\_\_\_

Component	Status		Reason/Action	Service	
	O	NO		OUT	IN
Meloy SO <sub>2</sub>					
Meloy H <sub>2</sub> S					
Meloy Calibrator					
Computer					
Cassette Drive					
Teletype					
DAS					
Hi-Vol					
WS/WD 10M					
Temp. 10M					
General:					
Fire Exting.					
First Aid					
Tlr. Cond.					
Sample System					

STATUS: (O) Operational; (NO) Non-Operational, on reporting date.

[Note in reason/action column, all major NO status during week]

REASON/ACTION: Nature or cause of malfunction and recommended or performed action taken.

SERVICE: Date of malfunction (OUT) and expected date of return-to-service (IN).



# Weekly Air Monitoring System Status Report

[illegible]

[Note in reason/action column, all major NO status during week]

SERVICE: Date of malfunction (OUT) and expected date of return-to-service (IN).